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NEW COMPUTER EXPRESS

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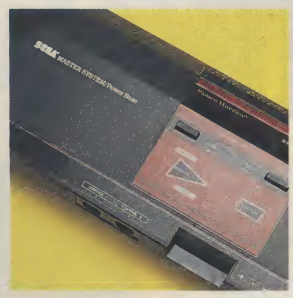

1989 THAT WAS THE YEAR THAT WAS

Hackers • Intel 486 • Portables • Viruses • STE • CD-ROM
Dragon's Lair • Hand-helds • Consoles • Stacy • Multimedia
Sex • Violence • SAM Coupé • Robocop • Archimedes 3000
TT • Piracy – the definitive review of '89 starts on page 60

PLUS: Police treat PC 'AIDS virus' as blackmail; Faults warning on C64; Bumper Listings; Quiz of the Year; Columns for the PC • AMIGA • ST • C64 • BBC • ARCHIE • PCW • XE • SPECTRUM • CPC • QL • MSX

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Long-standing Commodore problem still not fixed

C64 TAPE FAULT HAUNTS BUYERS

Computer retailers are warning buyers of the C64 to be prepared for the strong possibility of software compatibility problems.

The dealers say many first time users will be experiencing problems with their new computers this Christmas because of a fault in the machine's tape datacorder. They are bracing themselves for a massive influx of returned machines in the New Year.

Commodore expects to sell 140,000 C64s in the run up to Christmas making it the second biggest-selling computer after the Spectrum. The company says it is aware of the problem but warns that no action will be taken until next spring.

Amazingly, it's the same problem which annoyed buyers and dealers last year. Then, shops were reporting returns of up to 80 per cent. One dealer told *Express* that, by March this year, customers had returned to him every C64 that he'd sold in the pre-Christmas period.

• Commodore C64: tape loading fault still haunts buyers

DATA FAULT

The fault concerns the separate datacorder called the C2N. It cannot load many commercial games because they are written at fast load rates. The C2N is designed to pick up a data transfer rates of 300 baud. However, in their attempts to speed up the loading process many software houses release games which load at between 1,200 and 1,500 baud.

Commodore defends itself by pointing out that the software houses are well aware of the C2N's baud rate and that they should stick to recommended specifications rather than looking for loading short cuts.

Some buyers of the C64 will find that certain games will not load on their machine. The C2N has to be fixed with a tape head re-alignment kit – and even then it is not 100 per cent certain that the C2N will work.

After last year's returns debacle, dealers demanded action from Commodore. The firm did not change the datacorder, but instead set up a new system whereby returned computers could be dealt with more quickly.

Also, games bundled in with the C64 have been re-designed to load at 300 baud. Therefore new buyers won't notice the fault until theystart buying commercial software.

Patricia Steadman of Commodore specific Bits and Bytes in Liverpool commented: "We have posters up telling people to buy a tape head re-alignment kit. Buyers need to be educated that just as you need to fix a plug when you buy a computer then you also need such a kit." However, these kits cost around £10.

EXPECTING RETURNS

At GB Microland in Waterlooville, Glynn Downing warned that the kits would not always solve the problem: He added: "We had returns of about 60 per cent last year and, though it's been all right so far, we're expecting a lot after Christmas."

Commodore says it can't spare the manpower in its Research and Development department to investigate this. "We're concentrating on the PC range at the moment," offered marketing communications manager Jennifer Perry. "The C64 only costs £149, and we don't make a lot of margin on that.'

"The problem will be addressed and a solution will be found in the second quarter of next year. " She refused to comment on the nature of the solution.

RETURN OF THE KILLER Bs

• Fans of ultra-tacky B-movies of the 1950s won't be able to keep their hands off Cinemaware's new release It Came From The Desert. *Games reviewers are already calling the game Cinemaware's best title to date. The firm concentrates on feature-style games with a leaning toward good graphics and simple gameplay.*

It Came From The Desert includes lots of hilarious nasties including a swarm of giant ants – it's available for the ST, Amiga and PC for £24.95.

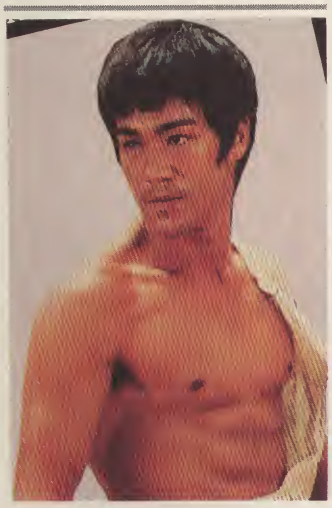
• Elonex: 386 on the move

On the road

A low-cost 386 laptop has been launched by Elonex, which the manufacturer says represents a breakthrough in the power-to-price ratio.

The LT386sx weighs 6.5kg and runs at 16MHz. It also has a gas plasma 640x480 VGA display and a 40Mb fixed disk. There is 1Mb of RAM on board which is expandable to 4Mb.

"With laptops often costing more than twice as much as equivalent deskbound machines, PC users have traditionally had to pay for the privilege of portable processing," offered a spokesman. "We think this bears a lower price-tag than many desktops with far less power." It costs £1,799.■



• Lee: back with a vengeance

Jeet kune do: the micro way

He's back. The late hero Bruce Lee is to kick his way through your computer in a new game from The Software Toolworks.

Toolworks is hoping to stun computer gamers with this martial arts adventure. It uses artificial intelligence, so Bruce's enemies in the game can learn your techniques in the art of jeet kune do.

***Bruce Lee Lives* is available for the PC with ST and Amiga versions promised for February. It costs £24.99.**

Meanwhile, fast-growing Software Toolworks has moved up into the big league of worldwide software publishing with the acquisition of Mindscape.

It is not thought this will affect the UK operation as both Mindscape and Toolworks are distributed by Mindscape UK in this country.■

Trojan horse trashes hard disks – unless you pay up

IT'S COMPUTER BLACKMAIL

35,000 LETHAL DISKS SENT OUT TO PC USERS

Fraud squads in London and New York are investigating the first known attempt at large-scale extortion through rogue computer code.

by ANDY STORER

As many as 35,000 disks containing a 'Trojan horse' virus have been mailed to businesses as far apart as California, Thailand and Zimbabwe in a co-ordinated attempt to disable computer systems.

Packaged under the name 'AIDS Information Introductory Diskette', the 5.25-inch disks are accompanied by a letter which threatens that "your computer will stop functioning normally" if licence fees of $378 are not paid to a company described as the PC Cyborg Corporation at a box number in Panama.

AIDS RISK

The software purports to evaluate a user's risk of contracting AIDS by asking a dozen questions on sexual preferences and activities. In order to run, the questionnaire has to be installed on a hard disk, and once running the Trojan code corrupts the hard disk's root directory and sets off an incremental counter which keeps track of your computer's disk activity.

After 90 system resets, all hard disk directories and files become encrypted – making the drive inoperable. 'Licensed' users would then, presumably, be issued with decryption code to make the files readable again. Since the diskette contains a file which prints out an invoice, it would appear that large-scale blackmail is behind the attacks.

EXTORTION

An American counter-crime unit, the Computer Emergency Response Team, has confirmed that the box number does exist, and are thus treating the case as a sophisticated attempt at extortion.

Although the total number of disks in circulation is unknown, police sources suggest as many as 35,000 disks may have been distributed. In Britain, up to 10,000 disks were mailed first class from West London post offices on December 11th to a wide range of hi-tech companies.

National banks, telecommunications companies, Health Service establishments, universities, national newspapers, and international stock exchanges are known to have been among the targeted recipients of the program.

A leading direct mail magazine for PC professionals, *PC Business World*, was unable to comment on speculation that the disk was distributed to addresses based on portions of its subscription list. However, the magazine is offering to provide an antidote free of charge. It has contracted top virus expert Jim Bates to disassemble the Trojan's code and provide a remedy.

The mailing list the magazine is reported to have sold contained at least 7,000 names of business PC users and was bought by a Kenyan businessman, a Mr. E. Ketema, who has since disappeared without trace. It appears, however, that other magazines' mailing lists were also purchased, and the total number of disks could be much higher.

UNSOPHISTICATED

Computer crime police and anti-virus consultation groups have been inundated with calls from recipients who had unwittingly installed the bogus software. But experts from the *Virus Bulletin* newsletter have been quick to point out the AIDS disk doesn't contain a replicating virus which attempts to copy itself *ad infinitum*, but a relatively unsophisticated time bomb or Trojan horse.

However, they advise users not to attempt to remove the Trojan, other than by a complete reformat of the hard disk, since the rogue code disguises itself as a read-only, hidden file.

However the question remains unanswered as to why a company would spend something in the region of £5,000 to pay many thousands of pounds labelling and postage to distribute a Trojan which is set to trigger after such a large number of system resets.

The AIDS disk case is likely to refuel calls for legislation against viruses and, by implication hacking, during this session of Parliament. Thus it comes as no surprise that a Conservative MP, Michael Colvin, has announced his intention to introduce such a bill, with penalties of fines and prison sentences for computer crime, as soon as is practicable. ■

US supercomputer aids Chernobyl clean-up

The ban on the export of sensitive technological equipment to the Eastern bloc has been relaxed slightly to allow the sale to the Soviet Union of a supercomputer which will be able to predict the long-term effects of the Chernobyl nuclear disaster.

Until recently the Soviets had no access to such a machine, as it has had to be specially developed by American firm Control Data. Scientists in the devastated Chernobyl area are to enter data into the computer in order to gauge the long-term effects of radiation on the environment. It will also help limit radiation exposure to workers on other nuclear power plants.

The technology embargo was tightened by the Americans after the Soviet invasion of Afghanistan, but recent developments in Eastern Europe have helped persuade the US government to relax its export regulations.■

Few, what a scorcher

The Second World War Battle of Britain is to be re-created in a new computer game called *Their Finest Hour*.

The exploits of Churchill's 'few' will feature in the four-disk extravaganza from Lucasfilm, due out in February. Players will be able to pilot any one of eight British or German planes.

You also have the chance to get involved in historically-accurate air battles based on attacks on RAF airfields – or you can make up your own missions.

The Battle of Britain was fought in the summer of 1940. Despite facing a greater number of aircraft, the RAF pilots managed to beat back the Luftwaffe. The game features fast action and impressive graphics – it will cost £24.95 and will be available for the ST, Amiga and PC.■

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• Flight Sim 4.0: *sky's the limit*

Super fly buy

MicroSoft is releasing a new version of its popular *Flight Simulator* package on the PC.

The classic program has been the doyen of businessman since the launch of the PC. It incorporates an accurate digital map of parts of the USA, and you can pilot your plane through recognisable landscapes – it is, for instance, possible to fly under the Golden Gate Bridge or to buzz the Sears Tower.

Version 4.0 for the PC has a whole host of new obstacles for budding pilots to avoid, including randomly-generated clouds, adverse weather conditions and other air traffic.

MicroSoft is also offering an option whereby you design your own aircraft.

Flight Simulator 4 arrives in the UK any time now and costs just under £50. Call 0734 500741.■

Bite out of Apple

A lower than expected demand for Apple computers in the home has caused problems for the massive American firm.

It had forecast massive growth among home buyers this year, particularly in the US. However, despite strong sales into the business sector, the firm's low-end business has failed to take off as it was expected to do.

Shares in New York took a nose dive last Wednesday when it was announced that profits would be down on last year's excellent figures.

When Apple shares were first sold on the Wall Street Stock Exchange it was the most over subscribed flotation since Ford. The 4.6 million shares were scooped up within one hour and over 40 people were millionaires within 24 hours of going on sale.■

Shows sold by Database

Database Exhibitions, organiser of the recent Computer Shopper Show, has been bought by Blenheim Exhibitions.

Blenheim, one of Europe's largest exhibition organisers, already stages 70 technology-based shows in the UK, France, Belgium, Switzerland and Spain.

The firm is hoping to get involved in the lower end of the computer market.

There had been fears that the popularity of computer shows are on the wane. However, a shake-up of the exhibitions circuit over the past year has seen machine-specific shows losing ground to larger multi-format shows such as the Shopper event. ■

Sugar takes on socialist market with 1512 and 1640

RUSSIAN AMSTRAD PC SHIPPED OUT

Amstrad has designed special versions of its PC1512 and 1640 for the Soviet Union.

The machines' keyboards have been configured with Cyrillic characters and software packages have also been put together in Russian. Amstrad is hoping to steal a lead over competitors for the lucrative Eastern bloc markets.

The firm's brand name is extremely strong in East Germany and Poland already and sales of PCW machines to those countries have traditionally been strong. Now, Russians and other Eastern Europeans are desperate to get hold of PC compatibles.

The low-cost 1512 and 1640 have been chosen because they are cheap enough for Soviet agencies to afford. However, Amstrad says it won't be shipping thousands of computers out to the Soviet Union just yet. "So far we're just shipping a few models for evaluation. We really have to look at the lines of credit. The rouble isn't a particularly strong currency and, unlike certain Western companies, we're not prepared to give lots of credit to Eastern bloc countries."

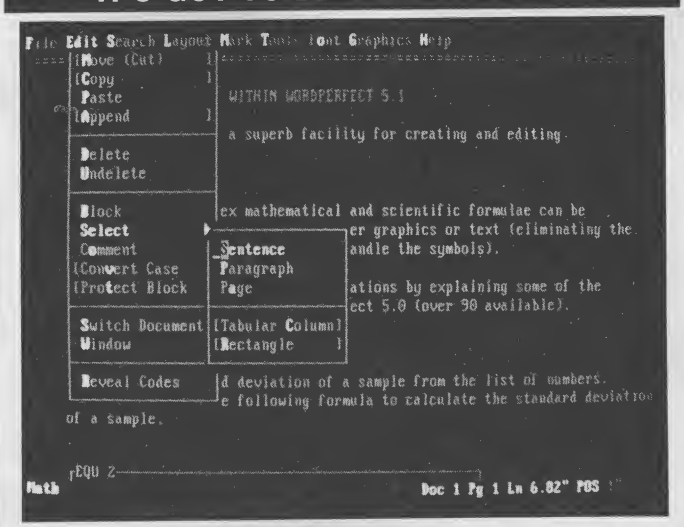
Cautious Amstrad is to air freight computers to the Eastern bloc because of the notorious pilfering that goes on at docks – especially of desirable (and saleable) electrical equipment.

But the firm definitely sees a future in the East. At a shareholders meeting last week chairman Alan Sugar was asked if the opening up of East Europe presented golden opportunities for his company: "It's very exciting," he said. "The trouble is getting paid."

Sugar added: "My intuitive feeling is that good times will be back. I know that we have a good business."■

• *PC1512: Russian re-birth for aged Amstrad PC clone*

IT'S GOT TO BE WORDPERFECT



The WordPerfect Corporation, famous for the world's biggest selling word processor of the same name, has just launched an updated version of the program.

WordPerfect in its 5.1 version is now equipped with a vast array of useful features to aid ease-of-use and increase productivity. The first major change is the addition of a menu system which is mouse operated, making it easy for even novice computer users to get the most from the program. A table-creating function enables users to import spreadsheet data and the program also features a comprehensive set of mathematical symbols to display and edit equations. By typing normal text and numbers into a split screen the program automatically displays the equivalent mathematical symbols for the operations being performed.

WordPerfect 5.1 costs £425 iand is available from WordPerfect UK on 0753 586655.■

Learning with word games

If you thought educational software was boring then think again. Software house lansyst has brought out an educational adventure game intended to liven up the tedium of learning.

***LEX – Wizard of Words* is an intriguing adventure, testing skills with word, number, and spelling problems, all displayed as animated graphics.**

There are eight trails to tax your knowledge of words and you can be assured that every time you play it you won't be asked the same questions as they are taken from a vast databas of possibilities on disk.

***LEX* will take you many hours to complete, even if you are a Scrabble fanatic and do the *Times* crossword every day, so you won't get easily fed-up with it, and it will keep children fascinated.**

***LEX* is for young people aged 10 and over and will cost £24.95 on PC-compatibles with any graphics adapter. It is available now from lansyst on 01-607 5844.**■

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New Spectrum-compatible machine on sale

COUPE ARRIVES IN SHOPS AT LAST

After years of development and months of hype Miles Gordon Technology's SAM Coupé has arrived.

Barring a disaster, the machine was due to go on sale on Monday. Those people who have already put in orders can expect to receive their machines over the next few weeks. And more than 160 shops throughout the country are to be supplied 'as soon as possible'.

MGT says it has spent the past few weeks laboriously testing and re-testing the computer. Of particular interest is the level of Spectrum compatibility. Since little in the way of Coupé-specific software is around at the moment many users will be stuck with Speccy software at first.

The firm says that much of the modern Speccy software will run on the machine although the compatibility rates decrease with older programs.

Merchandising firm USD is currently looking at the possibility of sticking 'Coupé compatible' stickers on software packages which will run on the machine.

"We won't really know what can run and what can't until the machine is out there. We have to rely on the users," said MGT's joint boss Alan Miles.

He said many MGT employees will be spending Christmas trying to get large volumes of the machine out as quickly as possible. The Coupé retails at a basic price of £169.95.

• The Coupé is here at last, pictured with its developers Alan Miles and Bruce Gordon

Express on the move

This double issue of *Express* is the last of the year – don't bother going to the newsagent next week because there won't be an issue. We'll all be having a jolly good time celebrating Christmas.

Over the festive period the removal men are coming in to shift Future Publishing and *Express* to new premises. Our spanking new address is: *New Computer Express*, 30 Monmouth Street, Bath, Avon, BA1 2AP.

In the meantime, have a wonderful Christmas and a prosperous New Year...

Big Green

IBM is to help protect the environment with the setting up of a multi-million pound research centre in the university town of Cambridge.

The firm has been pondering setting up such a unit for some months, and was hoping to persuade the government to help with a cash boost. Now the company, in conjunction with Cambridge University, is in discussion with a number of British companies with a view to raising £14 million.

It is understood that IBM UK's 'environment-conscious' chairman Tony Cleaver was keen to push the project through. In the past IBM has been criticised for the harmful emissions some of its manufacturing plants produce.

• Martin: lost communication

Grand prix firm bust

Veteran games publisher Software Communications has gone bankrupt.

The firm had been active in the British software scene since 1982. It was best known among gamers for its main label Martech, which produced the likes of *Armageddon Man, Nigel Mansell's Grand Prix* and *Vixen*.

The firm has had its problems. It spent four years developing a game called *Nimitz* which never appeared.

In more recent times it developed another label called Screen 7. That was a joint venture with a company called A1 which will probably retain all the licence rights, including *Jaws*, which was signed in the summer.

The company was set up by former maths teacher David Martin. He was not available for comment last week, but still has commercial interests in Irish programming house Emerald.

• Classmate Plus: everything you need from a PC in one box

Opus starts new class

Opus is to offer users a 'complete' starter pack based on its XT Classmate PC.

As first predicted in *Express*, the package has been put together in order to woo students as well as schools. "It's aimed at buyers who want a complete off-the-shelf system which gives quality computing at an affordable price," said sales director Martyn Breffit.

Buyers will be offered a Classmate PC along with a mono monitor, dot-matrix printer, word processor, database and diary. That lot retails normally at just over £1,000. However Opus is offering the Classmate Plus pack for a heavily-discounted £799.

The Classmate itself is a 20Mb hard disk machine with a choice of 5.25-inch or 3.5-inch disk drive. Memory can be upgraded from 640K to 1Mb.

Opus is one of the few British computer firms which actually manufactures in the UK.

• Citizen: heavy usage

Citizen's new models

Citizen has launched a new range of professional printers which the firm says will suit businesses looking for a low-cost option.

The ProDot nine-pin printers start in price at £439, and feature an 80-column carriage and and run at 300 characters per second in draft mode and 60 CPS in near-letter quality. Citizen says the machines are 12 per cent faster than their rivals.

It is estimated that sales of sub-200 characters per second printers will decline over the next few years, with higher quality printers becoming more popular despite higher prices. Some 75,000 sub-200 CPS printers are expected to be bought in Western Europe through 1990, with a predicted figure of 803,000 for 201-400 CPS devices.

COMMENT

Why the AIDS virus shows how real the threat of computer terrorism is real, and how the Government must take action now

The 'Trojan horse' attack on computers in Britain and other countries last week could so easily have been formulated expressly for the benefit of sub-editors on the daily tabloids. To have cached this software nasty on a disk which purported to evaluate users' risk of exposure to AIDS almost begs for screaming banner headlines of the 'Now computers catch the AIDS virus' ilk.

Indeed, who can say for certain at this stage that publicity is not in fact the main purpose of this grand-scale attack on the hard disks of big business operators?

On the face of it, the scam is nothing more than a sophisticated attempt at mass extortion, and that is exactly the way in which police in both the UK and USA are currently treating the case. The perpetrators of the sheme will have bought at least one – probably several – mailing lists, had up to 35,000 disks duplicated, and mailed those disks out to the targeted organisations.

With ingenuity and a good deal of hard work, it is possible to achieve all these without actually laying out hard cash, but in all probability the AIDS gang – if we may call them that – have parted with something in excess of £20,000 in order to achieve international distribution of their deadly Trojan horse.

One cannot off-hand write off the possibility that this is all some millionaire misanthropist's idea of a practical joke. Larger sums than this have been expended on back-garden follies or purely eccentric car customisations, so it does not defy credibility that there is someone out there prepared to invest a five-figure cash sum and a stack of hard work purely to line themselves up with a good chortle over Christmas. However, common sense suggests this is unlikely.

EXPLOITATION

The hypothesis that the purpose of the exercise is one of extortion certainly holds water, not least because the software presents itself in just such a manner. 'Send us your money,' it effectively says, 'or wave goodbye to the contents of your hard disk'. This would seem to make financial sense from the point of view of the extortionist. If even 10,000 copies of the rogue program managed to find their way on to hard disks and just 10 per cent of stricken companies decided to pay the asking price of $378 for a cure – peanuts to most of the targeted victims of the ruse – the villains would net approaching a quarter of a million pounds for their efforts.

The question remains, though, of why the authors of the Trojan have chosen to design it in such a way that so much opportunity is afforded to victims to seek an alternative cure to their problem. Most computers have their systems reset only once per day, so a virus which triggers after 90 resets allows most victims as long as three months to eradicate the Trojan by other means than paying the blackmailers and crossing their fingers that an antidote is indeed supplied by return of post.

Surely it will have occured to the instigators of this relatively sophisticated scheme that the body of rich and influential businesses and institutions which they have struck at are likely to make a combined attempt to write their own cure for the problem, either through in-house expertise or by corporately hiring expert help. They must also realise that for many other targets of their sting, three months is plenty long enough to make floppy-disk or tape-streamer back-ups of their data, then format the hard disk and re-install a clean system before the fateful day of disk encryption actually arrives.

For the same reasons it would probably be fanciful at this stage to regard the operation as the opening shot of the era of computer terrorism, predictions of which were so glibly pooh-poohed by some people when reported in *Express* only two weeks ago. Again, international terror organisations would surely take another route than one which allows the victim three months to seek relief from the threat.

Whatever the real objective of the AIDS Information Introductory Diskette and its sneak attack, the episode certainly carries lessons for the previously unwary. The first of these is that it is not just kids swapping duplicated software who are at risk from viruses. Most major organisations will by now have built filters into their systems to prevent these unwanted visitors entering their computers, but this episode may have persuaded some smaller operations that their confident assumption that 'viruses are a problem which does not apply to us' is unfounded.

Secondly, even if we can assume that this is not some form of terrorist attack, our vulnerability to such a threat – as a society which relies so heavily on computers – must now be readily apparent. What a gang of extortionists can do today must surely be well within the capabilities of a determined terror group tomorrow.

TERROR

The fact that a fresh and highly promising phase of detente between East and West is now well under way is little cause for relaxation where political terror is concerned. Whatever its past shadowy affiliation with some of the world's extremist groups and nations, the Soviet Union has rarely if ever been identified as the direct sponsor of acts of terrorism, and it requires little imagination to take a sheet of paper and begin to jot a list of those who might take pleasure in seeing the electronic fabric of Western (and indeed other) societies disintegrate at the drop of a virus.

It is, therefore, time that we ceased automatically to brand crystal-gazers such as Professor Gary Perlstein (whose thoughts on computer terrorism were reported in these pages so recently) as 'barmy boffins'. Whether individual forecasts are alarmist or not, we should certainly take the subject of these researchers' fears seriously, and surely the stage has now arrived where the governments of more or less advanced societies must consider setting up a jointly sponsored think-tank on electronic terrorism in much the same way that their agencies already cooperate to counter the threat of hijackings and bombings.

And the subject of governments leads us inevitably to ask once again why our own Government is so unwilling to take the subject of interfering in other people's computers seriously. The 'AIDS' attack has taken place less than one month after we were obliged to report, sadly, that Secretary of State for Trade and Industry Nicholas Ridley had apparently turned his back on a Law Commision report on computer crime, and that no legislation on the matter was proposed for the current Parliament.

One hopes that sufficient laws already cover the subject of demanding money with menaces that the perpetrators of this attempted rip-off can be brought to book, but already there are suggestions of a potential defence by the extortionists that their warning that the software was installed on hard disks at the user's own risk might constitute an adequate disclaimer to be used as some form of loophole. If there is any truth in this conjecture, that alone is sufficient grounds for finding the state of UK legislation frightening.

Whether the 'AIDS attack' is the work of extortionists who have not fully thought through their scam, of practical jokers, of philanthropists who wish to bring the dangers home to us, or of political extremists firing a warning shot across our bows really doesn't matter. What does matter a great deal is that when someone next puts together any such scheme, they will do it far more carefully and, in all likelihood, far more successfully.

We hope fervently that more powerful and influential bodies than *New Computer Express* are thinking about the implications of that scenario at this very moment.■

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© Future Publishing Ltd • 30 Monmouth St, Bath, BA1 2AP • Tel: 0225 442244 • Fax: 0225 446019
Subscriptions: The Old Barn, Somerton, Somerset (0458) 74011
• Printed by Redwood Web Offset, Trowbridge, Wilts • Distributed by Comag, West Drayton, Middx

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1989: WHEN THE ST GREW UP

Yes folks, it's that retrospective time of the year again. Despite the disappointing STE and Atari's launch manoeuvres, 1989 has been filled with superb packages (*Calamus*, *That's Write*), wonderful games (*Populous*, *Kick Off*, *Stunt Car Racer*), excellent peripherals (*ST Format*, Multiface) and hardware breakthroughs (cheaper and better hard drives, the TT, Stacy, Mac and PC emulators).

It has been a year in which the ST expanded into new areas. As double-sided drives became the norm, games got ever bigger and more ambitious. And the barrier around thoughtful games (adventures and role-playing) dissolved, thereby allowing a healthy injection from exciting graphics-based games, ultimately resulting in the likes of Electronic Arts' *Hound of Shadow*, Empire's *Time* and Infogrames' *Drakkhen*.

At the other end of the scale, packages such as *Calamus* and hardware developments such as the Stacy and the Mac emulator *Spectre* GCR reinforced the point that the ST has an extraordinary future as an affordable business machine. Indeed, companies about to invest in expensive Macintoshes could do worse than to look at what is happening in Germany, where the ST continues to be thought of as an office essential.

Enough preamble. Come, then, on a journey through time gone-by. What do you recall of the year that is done?

LATE 1988

At the vast Las Vegas Comdex computer trade show a prototype of the newly developed laptop ST, the Stacy, is due to be unveiled. A last minute change of heart, however, sees the machine hidden in a back room – even though its specifications are fully and accurately reported in *ST Amiga Format*.

United States vice-president of operations, August Liguori, explains that he is unhappy about putting a prototype on the exhibition floor. He expects the Stacy to ship in the first half of 1989.

DECEMBER

The 1988 microcomputer industry awards go to Firebird's *Virus* (Game of the Year); Melbourne House's *Xenon* (Best Sound); Rainbird's *Starglider II* (Best Graphics); Grandslam's *Pacmania* (Best Arcade Conversion); Mirrorsoft's *Dungeon Master* (Adventure of the Year) and *Falcon* (Simulator of the Year). Programmers of the Year accolades are rained upon the shy Bitmap Brothers.

ST Amiga Format decides on *Flair Paint* as both Longest Awaited Program and Best Non-Game of the Year, while worst Non-Game dis-honours are visited upon *E-Type Typewriter Simulator*.

Atari announces a new 'US Gold beating' assault on the software market, launching programs for the ST and the PC, as well as something called the Amiga. The ARC label is expected to produce 40 titles in 1990. This time it's really serious.

JANUARY 1989

Rumours of a new 'Amiga-beating' super ST are fuelled when US-based Megabyte Computers reveals that it is negotiating with Atari to supply high-speed circuit boards. But whispers that the new beast is to be built around the 32-bit 68020 chip are killed stone dead: the dear old 68000 is not yet ready for retirement.

FEBRUARY

All hell breaks loose when Gainstar begins selling US grey imports of the mighty DTP package *Calamus*. Atari, which owns the UK rights, insists that the grey product is 'heavily bugged' and that its own programmers are working on a debugged UK version.

Atari announces the imminent arrival of the Mega ST1, a 1040 in a Mega's clothing, offering superior keyboard and case for business users.

MARCH

Word has it from the Which? Show that the Stacy is now going to hit the streets in April. Optimists anticipate a release date of the first of the month.

Romantic Robot brings forward the backup utility Multiface, enabling users to save screens and entire games. The launch breathes life into the flagging piracy debate, an argument more noticeable for its heat than its light.

APRIL

The confused *Calamus* situation begins to clear, as Atari explains patiently that no – it's not at all in DMC's bad books and, yes – it is planning to release *Calamus* in the UK and, yes – it will be distributed by Signa. Price is confirmed at £400 – about a £100 more than the allegedly bug-ridden US grey import, which won't in any case work on the UK ST. If nothing else, *Calamus* proves an excellent DTP package with which to grab headlines.

And in a good month for look, it's-really-not-like-that type announcements, Atari plays coy about plans to revamp the tired £399 STFM bundle, except to promise that the pack 'will be so strong it will still be attractive next Christmas.'

Meanwhile considerable excitement is stirred among ST gamesters by the news that ReadySoft is after all intending to release the fabulous *Dragon's Lair*.

HiSoft begin importing Data Pacific's US *Spectre 128*, Dave Small's Apple Macintosh emulator with a small but significant difference: Mac disks can be read and written by the ST.

MAY

Rumours of the upgraded ST range begin once again, though curiously this time round details are even sketchier than earlier. One thing is certain, however: the new machine will definitely be an 'Amiga beater.'

JUNE

Increasingly ST news is being made in Germany. After all the kerfuffle about DTP package *Calamus*, Cavendish introduces *That's Write*, a feature-packed £129 word processor with automatic indexing, automatic text formatting and multi-column page layouts, editable keyboard, dictionary, four cut and paste buffers, automatic back-up, paragraph and page stylesheets and graphics support. What Germany does today, the rest of the ST world seems to do tomorrow.

JULY

Suddenly the rumour mill whirs round at top speed. Atari UK's MD Bob Gleadow says: "The look and feel of the ST hasn't really changed much in the past three years. What we need to do now is look at providing a new upmarket second-time buyer's machine." This turns out to be a coy reference to the £2,000 TT.

Sources at Atari promise a machine 'before Christmas' that will 'challenge the Amiga head on, matching it in specification and undercutting it in price.' Such as? Such as 256 colours on screen, as opposed to the ST's 16; four-channel stereo sound and hardware scrolling.

• *520ST: knocked off Best Computer perch*

Remarkably, this statement turns out to be wrong on only two counts: the machine doesn't arrive before Christmas, and it's not an 'Amiga beater.'

At the Atari Show Elmtech unveils an astonishing ParSec graphics interface. Even the basic board is enough to make techno-boffins reach for the Valium: resolutions up to 1,024 by 768, 4,096 colour palette (four bit planes) with 16 colours per line, 32-bit 50MHz Texas Instruments processor and 768K of video RAM. Shortly afterwards comes another upgrade which boasts a palette of nigh-on 17,000,000 colours, with a few short of 200,000 on screen.

Modestly Elmtech claims that its graphics package under development will 'make the Quantel PaintBox look like a crayon set.'

AUGUST

Britain gets a new ST-dedicated magazine as *ST Amiga Format* splits to form *ST Format* and another mag, apparently for the machine called the Amiga.

Yet again it's a case of 'good news, bad news' for Atari. Bad news is that the 520ST gets knocked off its perch as Best Computer of the Year in an annual poll of magazine editors. Consolation comes in the fact that 520ST loses the award to big brother, the 1040ST.

In bullish mood Atari's president Sam Tramiel boasts that the company will 'dominate the handheld market and kill off Nintendo.' Apparently he is not in the least bit concerned by the massive lawsuit slapped on his company by that very same Japanese corporation.

In a blaze of publicity the Copyright, Designs and Patents Act comes into force, briefly raising hopes that piracy will cease and there won't be any more letters in the computer press from anonymous thieving illiterates. This turns out to be a false dawn, and soon it's business as usual (in every sense).

SEPTEMBER

Atari launches the ST upgrade 1040STE and the TT at the Messe in Dusseldorf. There is no sign of the STE's 256 colours on screen, making it immediately apparent that talk of an 'Amiga beater' had been not so much economical with the truth as Scrooge-like.

Nonetheless, enquiring interest in the machine runs so high that Atari hides the STE under piles of old press releases and a table at London's PC Show. During the press conference the machine is not mentioned, while the Stacy and the TT are introduced briefly and apologetically.

Even so, both the laptop and the high-end machine look incredibly impressive, suggesting that the STE debacle is only a temporary embarrassment with the primary fault being expectations that had soared unfeasibly high.

OCTOBER

Now it's ReadySoft's turn to do a 'good news, bad news.' Sorry, folks, but *Space Ace* is still yonks away. Never mind, the sequel (!) is almost upon us.

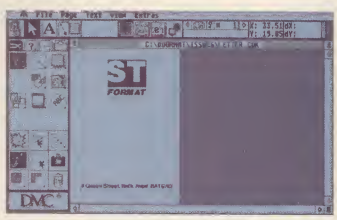
NOVEMBER

In an unedifying spectacle, Atari stamps its foot in corporate pique as programmers admit to being underwhelmed by the STE. One wonders if the company would have been so fast to refer to non-disclosure agreements had the reviews been raves.

Mirrorsoft's upgraded £200 DTP package *Fleet Street Publisher*, version 3 gets a launch. Though not up to its claims as a rival to *Calamus* it, nonetheless, provides further evidence, as if it were needed, of the ST's push upmarket into serious and business applications.

The hyped Alexander Palace Computer Shopper Show resounds with success – unless you expected ST hardware and software launches, or were among the unfortunate hundreds locked out after the place clogged with thousands of present-buying punters.

Atari announces a new 'US Gold beating' assault on the software market, launching programs for the ST and the PC, as well as something called the Amiga. The ARC label is expected to produce 40 titles in 1990. This time it's really serious.



• Calamus: *good at grabbing headlines*

DECEMBER

Atari's new ARC label comes under fire from an American company of the same name. This time it's *really* serious.

Atari US announces a 520STE and claims to have 1040STEs in the distribution chain in time for Christmas. Computing veterans (ie those who recall the same story cropping up for the past four years) suppress a yawn as Atari, without even blushing, insists that STs are selling so fast that (all together now) new stocks are having to be air-freighted into the country. And we thought the 'Air Miles with new STs' was about something else altogether...

Steve Carey

HIGHLIGHTS OF '89...

OK, so the year isn't quite over yet, but it's very doubtful that anything exceptionally spectacular is going to happen during the remaining weeks. Anyway, here's a rundown of my personal highlights. Perhaps you'd like to write in and let me know what grabbed you during '89?

GAMES

This year just about gone saw the Amiga finally establish itself as the number one games machine. Indeed, many of the top software houses started to invest in the Amiga by porting ST games across.

In fact, it can be reasonably argued that the Amiga is the favourite development machine these days, with software houses such as Psygnosis and Ocean producing Amiga versions of products before turning attention elsewhere.

In terms of rating software, the big game of the year is undoubtedly Anco's *Kick Off*. If you still haven't bought the game, I'd suggest that you treat this as an absolute must for your own Christmas stocking; or give it as a gift to someone who hasn't got it already!

• Kick Off: *now with* Extra Time, too

I enjoyed other games this year too, including the likes of: *BatMan, New Zealand Story, International Karate Plus, Blood Money, Stunt Car Racer, Sword Of Sodan, Hybris, Shogun* (the adventure) and *Virus*.

HARDWARE

Cheap hard drives for the Amiga arrived in '89. Previously, hard drives had been expensive devices that were totally out of reach for the average home user. But with the release of the Commodore A590 unit and ASAP's Amdrive, true power computing was finally delivered to the masses.

Many home users also found access to inexpensive RAM expansions and processor accelerators without having to break the bank.

The hardware device that I most enjoyed playing with, however, would have to be Entertainment International's A-Max Macintosh Emulator. At last we achieved a synthesis of the best of the Amiga and the Macintosh worlds.

EVENTS

This time last year I predicted that the Amiga would be on level pegging with the Atari and that our beloved machine would be selling for only £299. While the first prediction has most certainly come true, the second hasn't quite panned out as I expected.

It is, however, a fact that the Amiga now sells within the Batman bundle for £399. Further, if you take the worth of the Batman software and hardware together, the sum turns out to be considerably more than the £100 above my projected £299 price tag. You are in effect getting an Amiga for less than I predicted! So there!

But for the chronicles of history the big event of 1989 undoubtedly has to be the launch of the premier Amiga magazine of this planet. I am, naturally, talking about the sister of *New Computer Express*, the highly-acclaimed *Amiga Format*. Always number one for news, reviews, tips, cheats, advice and everything else, *Amiga Format* is that essential peripheral for your Amiga.

AND WHAT OF 1990?

So what can we expect to be in the stars for the coming year?

Well, 1990 might be the year of NewTek. The company has three major products lined up including the infamous Video Toaster and Digi-View, Version 4.

With the release of NewTek's high resolution HAM system within Digi-View 4, I think we can probably expect to see *DigiPaint 4* turning up to support this feature. Indeed, when NewTek unleashes these products, the Amiga graphics and video industries are never going to be the same.

But then, for the average home user, the number one software package of 1990 is almost surely going to be Mandarin's AMOS. From what I have already seen, Amiga owners are going to totally flip over what could become the best-selling Amiga programming system ever. Watch out for a full review in February.

And following on the lead of the WordPerfect Corporation, I wouldn't be at all surprised if we started to see a few PC and Macintosh software producers converting wares to the Amiga. Rumours have been circulating for months now of at least one PC software producer considering the possibility of converting an industry standard C-compiler system to the Amiga. I don't wish to jinx the industry before it gets in gear, but once one company takes the plunge, others are sure to follow.

Although nearly every other magazine has been predicting that Kickstart and Workbench 1.4 would be released in the early part of 1990, I would be highly (and pleasantly) surprised if we see anything of 1.4 at all before at least this time next year. Although 1.4 has been in development for quite a while now, the system still has a long way to go before it is near completion.

Additionally, expect to see quite major hardware releases from Commodore in 1990. The company has promised Unix boards, high resolution graphics cards and even the fabled Amiga 3000 (or whatever it is eventually to be called!)

A FINAL WORD

I'd like to round off my Christmas column, the last column of the year, by wishing you all a very merry Christmas, and a happy New Year.

Jason Holborn

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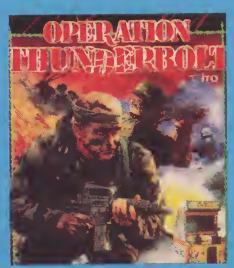

• Operation Thunderbolt: *definitely worth a look*

A year ago Ocean converted the hit coin-op *Operation Wolf* to home computers. Despite not having an Uzi machine gun add-on to play the game, it was extremely successful with fans of the original. Now that Ocean has taken on the conversion of the sequel game, how has the idea managed to keep up with developing software?

Well, *Operation Thunderbolt* has one definite improvement over the original, in that it has simultaneous two player action. You take the role of Roy Adams (from the original *Operation Wolf*), and along with a friend, you are responsible for rescuing a plane full of hostages from the ruthless Arab guerillas.

Play starts with you running down a street fending off enemy attackers as you try to contact an intelligence agent. Once this objective has been reached, you enounter a battle through a hostile depot to appropriate a vehicle for the next stage. With the jeep at your control, you must then fight through to rescue the hostages and escape from the rebel airstrip in one piece.

The graphics are very impressive, well up to the standard of the arcade version. As are the sound effects, with a whole host of bangs, yelps crashes and screams to please even the most bloodthirsty players. The tune could be better though; it lacks the power needed for a game of this type and distinction.

But, as said already, the really noticeable refinement on the original is the innovative two player mode: thanks to the use of two mice to control the aiming. To my knowledge, this technique has never been used before, and it makes *Operation Thunderbolt* stand out.

If you think you can handle the frantic action, and if you have a particular liking for gory games, then *Operation Thunderbolt* is definitely worth a look.

BEST SOFTWARE OF '89

Not only did Commodore clobber Atari in the games market, but the music industry (a traditional Atari stronghold) received the Amiga treatment too. Indeed, what a year it was for new software releases generally! Many packages finally started to tap the power of the Amiga system.

First and foremost there were the big three paint packages – *Deluxe Paint, Photon Paint* and *DigiPaint* – all of which received major upgrades during '89, to further enhance the Amiga's credibility as the ultimate graphics machine for those artists who find themselves on a tight budget.

But two packages really stole the show for me during 1989. The first, to which I have already alluded, Electronic Arts' *Deluxe Paint III*, is a utility that I truly could not live without, quite simply because it is the best of its kind – an essential for those of us with artistic flair.

The second, Microlllusions' *Music-X* sequencer system, has caused my music making to become a considerably smoother process. But that is not to say that other music packages – notably Dr.T's *KCS* and Passport's *Master Tracks Professional*, have not also started to get in big with musicians.

Indeed, at least for the Amiga, software is an exceptionally exciting area, and there is every reason to expect more – a lot more – advancement in 1990! Watch this space.

• Deluxe Paint III: *essential for those with artistic flair*

THE MOMENT STRIKES

Well, at last, it's the moment you've all been waiting for. The first of the prestigious, coveted, *Express* PC column awards. Too long has the PC industry missed out on the kind of shindig that all those poncey film and TV lovelies enjoy every other week. Now it's the turn of the Sugars, Gates and Minottos of this world to thank their mothers for the inspiration to make millions.

Actually the editor is far too mean to allow me a real awards ceremony, but this is the way it would have run if only I'd been given the chance.

So without further ado, please welcome Gary Kiddall, who will be your announcer for the nominations for the first of this year's awards.

MOST OUTLANDISH DOCUMENTATION

Nominations are:
Digi-Fonts, for its 5.25-inch square manuals
Alan Balfe, for the curious *Hard Disk Tips and Tricks*
Acorn Computers, for the MS-DOS documentation on Archimedes PC emulator

And the winner is – Acorn for providing three pages headed MS-DOS COMMAND SUMMARY as the only way into the operating system for new users.

The award might be accepted by an Acorn notable, who then says: 'Our policy of providing exactly what customers have asked for has paid off again and again. Everybody wanted to make the Archimedes work like a PC, but nobody asked for a book about it. We are thinking of providing our Unix documentation printed on the back of the box and that for our hush-hush super-mainframe on a pair of credit cards, which coincidentally is what you'll need to buy the machine'.

MOST INEFFICIENT PIECE OF CODE

Nominations are:
Digital Research, for GEM
Microsoft, for OS/2
AT & T, for Unix

And the winner is – Microsoft, for OS/2. This is one of the industry's most hyped products of this or any year. Billed as the replacement for MS-DOS, which takes up under 80K, and itself squeezed into less than... 4Mb.

The award could have been received by a Microsoft representative, who might have commented: 'It's the multi-tasking, you see, and the fact that it includes its own database and comms software. Who cares what the individual user wants, we want to attract the corporate accounts and they have the money for 6Mb of RAM'.

MOST INACCURATELY-NAMED PRODUCT

Nominations are:
Numonics, for the cordless Manager Mouse
Poqet computers, for the Poqet PC
The EISA consortium, for the Extended Industry Standard Architecture

• Poqet PC: nominated in this category

And the winner is – Numonics, for the cordless Manager Mouse. This mouse uses an infra-red link to pass data from mouse to receiver and then a...er...cord from receiver to the serial port of the PC. The power supply connects to the serial plug via a...cord...and the cells in the mouse itself are periodically recharged through a...cord...which attaches between mouse and receiver.

Award to be picked up by someone from Numonics, who then ought to say in his acceptance speech: 'I'm eternally grateful for this award, which will help to boost recognition of this product in the UK, and inspire us to early release of our new products. The cordless keyboard reduces to one the number of cords connecting the keyboard to the PC, and the cordless telephone need only be connected to a BT phone jack when you're making or receiving a call'.

• Portex: laser printer paper with holes

MOST DEVIOUS MARKETING PLOY

Nominations are:
Amstrad, for giving away a PPC portable with someone else's cellphone
Showerings Business Systems, for laser Portex paper
Inmac, for selling a manual crossover printer switch for £225

And the winner is – Showerings Business Systems, for chopping the tractor feed holes off dot-matrix Portex paper and selling it for more than the original! The judges felt that such daring and gall deserved recognition.

A suitably bubbly Showerings representative grabs the trophy and comments: 'The company would like to thank you for this award and to take this opportunity to announce another new version of Portex paper. This one's cut down to the size of Post It! notes and is ideal for photo-typesetting really important off-the-cuff thoughts. It will still cost less than three times the original price of a pack of Portex paper'.

MOST OVERPRICED PC SOFTWARE

Nominations are:
Inmac, for a manual crossover printer switch costing £225
Skye Industries, for a £95 parallel comms utility
The authors of *Grammatik III*, for the £95 style checker that repeatedly spots the verb 'ornate'.

And the winner is – Skye Industries, for the parallel-only file transfer utility which comes with no cable. What it does have is a 'Rocket Socket' which suggests superfast transfer, but is in fact no more than a Centronics to 25-way D convertor.

This file transfer, bundled with a rudimentary transfer utility, is meant to compare with *Laplink* and *FastLynx*, which discount to the same price.

Award might be received on Skye's behalf by Grammatik spokesperson: 'I ornated when I heard of this award, and can only bedstead how brocolli I am to recind this doberman from such a precipitate body as yours truly. Thank you able, and here's hopping you will coagulate to presentation the aardvarks to membranes of the industrial for manly years to combe.'

SPECIAL AWARD FOR SERVICE

Who has been the most misquoted personality in the computer industry? Who has more apocryphal tales to his credit than any other computing pioneer?

Our board of assessors has spent many long and arduous lunchtimes debating the merits of this year's candidate. They rarely make such an award (only once a year) and only for really outstanding services to the industry.

This year the award goes to probably the longest-standing figure in computing. A commander of computing machines – a doyen of digits – a guru of gears – fresh from his recent exhumation, we are delighted to welcome Charles Babbage to receive the *Express* PC column *Up Yours Award* for getting the whole thing started in the first place.

Charles Babbage says: 'I couldn't have done any of it without Ada Lovelace. She has been a continuing inspiration to me and there's no truth in the slanderous allegations concerning our early attempts at matriculation. I would like to thank the column for this honour and I will treasure it always. Thank you'.

And that completes this year's awards. The glitter, the glamour, the glitz, the glitches are over for another twelve months. We can watch the personalities of the industry slowly and unstably file out through the foyer of Future Towers.

There goes the moustached Basil Pigg, as cavey as ever in his innovative tan and white tuxedo. He's followed by my good friend Bertrum Carrot, coping bravely with his unfortunate handicap which forces him to walk down the steps backwards. And the lovely Kim Harmagh, vivacious and charming in the shimmering, hip-hugging dress with the daring thigh-high slits.

The spotlights die and the tinsel and decorations are taken down. There'll be no more crêpe until next year.

Simon Williams

HOW TO BE TOP

No doubt your stockings will soon be emptied, the choicest morsels will be consumed, the BBC's films will be slept through (with the possible exception of *Crocodile Dundee*) and it'll all be over.

So the new year will be staring you in the face and asking – what are your plans for the decade? Have you got the whole thing charted out?

Indeed, have you drawn up any organisational charts lately?

THE LAST REVIEW

Corporate Ladder is an organisational chart processor. It combines the features of a word processor, graphics package (character graphics only) and laser font handler in a single program. It includes an amazingly effective 'Finishing Touches' option – I kid you not.

This finishing routine takes the scruffy chart you've put together, centres all the text, moves the boxes into line and then lets you check it hasn't done anything silly. It usually hasn't, partly because it drew all the boxes itself in the first place.

Once tidied up, you can print out the whole sheet on your dot-matrix or laser printer (laser fonts are supplied). It can handle all kinds of charts and forms and comes in at £80.44.

My copy was supplied by Data Liberation, that company which also provided the *PopDrop Plus* program covered a couple of weeks ago. I neglected to include a telephone number on that occasion, so for either product, and probably a few more besides, ring 0983 864674.

TELECOMMUTERS RULE, OK?

Next up is an item which may not appeal immediately to those outside the Totnes area of south Devon, but has application throughout the country.

The Totnes Business Exchange is a pioneering organisation set up to help those who wish to work from home with a computer – to telecommute. This work doesn't have to be programming or computer journalism, it could be any trade which makes direct use of a micro.

The idea is to act as a Job Centre for telecommuters, linking those providing work with companies or individuals flexible enough to use home workers. In addition, the Business Exchange intends to provide support to those who register with it, by making available equipment and services most individuals find hard to afford.

This support will include access to laser printers, DTP equipment, and graphic services, the provision of training courses and a newsletter.

This kind of overall package should surely be the model for other telecommuter organisations in the country. If the electronic revolution is to continue to have practical benefits, flexible working arrangements need to become the norm, or at least more norm.

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On Micronet you can browse through an extensive software library of free programs, select one and then download it.

We now have software for all popular machines, from the Spectrum to PC compatibles, including the Atari ST and the Amiga.

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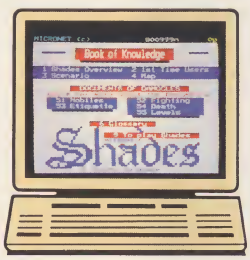
Micronet is also a computer magazine. Our computer news area is updated every day, so there's no better way to stay up-to-date, and our software reviews and features for all popular micros mean Micronet members are always better informed.

Add to this Prestel's massive database and you'll have all the facts at your fingertips.



ENTERTAINMENT

But Micronet is not just informative, it's also a lot of fun! As a member you'll have access to a range of games, including the UK's most popular multi-user game, Shades, where the action is live and so are your opponents!

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If you have access to a modem (1200/75 baud) and viewdata communications software you can see a free demonstration of Micronet. Just Dial 0272 250000 and use the ID 4444444444 and password 4444.

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SPECTRUM

STILL TIME

According to my calculations you should still have time to rush out and buy a game for Christmas (or for just after), either to give to somebody else or to give you a cunning excuse to escape from the crowd of annoying relatives who always seem to appear in one's home on or around the 25th.

Amazingly, most software houses have actually managed to get Christmas products on the shelves and ready to fall into your grasp for the necessary cash adjustment on time this year.

WHAT CHOICE!

After the longest drawn out, most hype-filled build-up for at least a week or two, Domark has finally completed the Spectrum version of *Hard Drivin'* (£9.99 cass/£14.99 disk). You should know by now that it's a conversion of one of the most impressive coin-ops for some time and the trumpets heralding its arrival were only drowned out by unkind comments about the feasibility of a Spectrum version.

But hats off, and prepare to pat those backs over at Domark because Spectrum *Hard Drivin'* is truly excellent, and after a few goes you'll realise it wasn't called *Hard Drivin'* just because it sounded more impressive than Quite Difficult Drivin'.

To begin with, simply staying on the road is difficult enough. Once you get the hang of that though, there's the choice of either a Speed course or Stunt course to crash on. In the case of the former, it's beating the two minute lap time and racing off against the mysterious Phantom Photon, while the latter offers a series of wacky tests of skill like a bridge jump, loop the loop, tunnel and, erm, that's as far as I've got.

Graphics are restricted to two colours as you might have expected, but the speed at which the filled 3D scenery moves past your car, and often into it, is easily fast enough for you to start leaning into corners and looking over the brow of a hill for oncoming traffic.

Where *Hard Drivin'* differs from other driving games is that you're actually required to limit your speed in order to get past certain bits the right way up, and with the option of a manual four gear box and action replay we're talking about probably the most realistic, not to mention enjoyable racing game to date.

Domark's *Toobin'* (£9.99/£14.99 Disc) has you indulging in the downright bizarre American pass-time, travelling down fast rivers in a rubber innertube. Naturally, there's a plethora of things along the way intent on puncturing your tube. There are rocks, fishermen, crocodiles, penguins and nasty spider type creatures all out to stop you and the only means of defence on offer is to throw tin cans at them.

Surprisingly, it's great fun, especially in two player mode when you can push your comrade into all the things I mentioned above. It's as slick and smooth in operation as Bob Monkhouse, but infinitely better looking, with more colours on screen at once than we're used to and only half a tad, if that, of colour clash. The concept might not appeal but I guarantee you'll be, like me, strangely drawn to it.

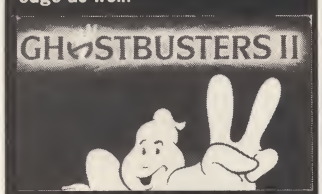
GHOSTBUSTING!

Released to coincide with the film and Christmas spending spree comes *Ghostbusters II* (£10.99) with Activisions' hopes that it'll sell as many units or more than the first offering.

There are three scenes in this particular game of the film. The first dangles you down a shaft chock a block with nicely drawn nasties that need to be fended off with your Ghostbusting weapon so you can recover the three parts of your slime scoop.

In the next level you're put in control of the Statue of Liberty with the objective being to guide her past more nasty ghost-types. And the final stage expects you to share your skills amongst the Ghostbusters and defeat the evil, but unfrighteningly named Vigo.

In between stages you have to put up with some dodgy mono stills that try, but fail, to link the whole thing together. And although it's perfectly good tehnically, none of the stages are jaw droppingly impressive or very addictive. I can see the frustrating multi-load and that arrrgh! inducing soundtrack pushing a lot of people over the edge as well.



• Ghostbusters II: *with soundtrack*

A BOOK FOR ALL SEASONS

Mike Gerrard, well known and loved adventure guru, has got a book out, *Adventures on the Spectrum*, which is a professional-looking publication about, well, adventures on the Spectrum.

Its 128 pages include chapters on the history of the genre, how to go about writing your own adventure, a rundown of the various clubs and fanzines serving those of an adventurous persuasion as well as an introduction for the unconverted. The remaining space is packed to the spine with solutions for some of the all time toughest Spectrum adventurers. *Shadows of Mordor*, *Serf's Tale*, *The Hobbit* and *The Pawn* are all given a sorting out within the book's pages.

Written in Mike's enjoyably friendly style throughout, *Adventures on the Spectrum* is a veritable mine of information, albeit maybe a pound or so too expensive a one at £4.95 a copy.

If there was any fairness in the world though, Mr Gerrard would be plugging it on Wogan and signing copies in Smiths, but as it is copies are only available via mail order for £4.95 + 50p postage (£1.05 outside UK) from Mike Gerrard, PO Box 7, Ramsey, Huntingdon, Cambs PE17 2UZ. Adventure fans: go out and get one this instant!

Robin Alway

PCW

LOOKING BACK

So, that's it for 1989. The low point was the debacle of *Mini Office Professional*, which appeared six months late with an American thesaurus, laughably slow spell checker and plenty of bugs. Database has tried hard to get over this set-back and the original, *Mini Office*, remains good value for money, but *Mini Office Professional* will need a face-lift if it is to emerge as a good buy in 1990.

But the highlights for me in a year which saw few major software launches would have to be: the amazing *Composer's Pen*, that lets you create, edit and print out music just as you do text documents, pushing the PCW into completely new areas; the excellent *Micro Design*, which showed that *Stop Press* was not the unbeatable desktop publisher we thought it was; *LocoFile*, the add-on database that works from inside *LocoScript*; and finally the announcement of *LocoScript PC*, which will be out next year, and may push many of us into the world of the PC.

But I don't think we'll be abandoning our PCWs just yet, thank you. Four years after the launch of the 8256, the PCW range remains the best and most economical option for anyone whose main objective is putting words onto paper and communicating.

Amstrad may have had its troubles financially in 1989, but the trusty PCW will continue to be one of its star performers into the 1990s.

BUILDING MEMORIES

PCW owners can do the seemingly impossible – purchase a few good memories – with SCA's memory upgrade.

The ingenious device is a simple plug-in box that fits on the back of your PCW expansion slot. It then adds 512K of memory to your machine: CP/M, *LocoScript*, *MicroDesign*, the *Composer's Pen* and so on can all make use of whopping 880K you get with a 9512 or 8512, or 368K on an 8256.

The box has a slot on the back so that you can still use your mouse or Centronics interface by 'piggy-backing' that interface on top of the SCA memory box.

You can even piggy back two memory boxes on top of one another, giving you enormous RAM, bigger than anything Derby ever produced.

Interested? Well, Eisenstein produce memory upgrades too, so it'll be interesting to see the two in a head-to-head. For more on this, check out the January issue of *8000 Plus*, which will hit the streets on Dec 21st.

Anyway, contact SCA on 0903 506606 and the memory box costs £119+VAT, or £136.85 in real money.

PRINTER'S DEVIL

If you have a 9512 and use a second printer, keep your daisywheel connected all the time – if you remove it, you can find that your PCW won't recognise the second one!

Basil Pigg

MSX

GAMES GALORE

For this Christmas edition of the MSX column in *New Computer Express* I thought I would pass on my views of some of the many games that I have played on my MSX.

A GRAND SLAMMER

Grandslam has over the last year released several titles for the MSX, and it is probably the most supportive of all the Ksoftware houses regarding our format.

Thunderbirds plays as a four-part game, each part being a complete adventure in its own right. You control two characters who have objects to choose and use in the quest for a happy conclusion to their missions.

It's a pity that this game is only available on tape, however, as each stage takes quite a bit of loading. But there are plenty of intriguing puzzles to solve, so *Thunderbirds* should take a while to get through – it's a decent challenge.

And with colourful graphics and reasonable music (the Thunderbirds theme, no less) I score *Thunderbirds* eight notches out of a possible 10. Well worth a try!

LEAPING EPYX!

In the past I have not been kind to games released by Epyx for the MSX.

But *4x4 Off Road Racing* has been available for a few months now, and while it's not a classic in the graphics department, it is enjoyable and playable .

Not only do you get to choose the type of vehicle you want for the race, you equip the vehicle as well. But be careful not to overload it, and don't spend too much money either!

Next it's off to the race, and as there are 16 opponents in each stage, winning is not going to be easy, even though you do have three lives to lose.

As I said previously, graphics are only fair, better than *Outrun* but not as good as *WEC Le Mans*, while the sound effects are not bad at all. I think *4x4* deserves six out of 10.

ROAD WARS

Although no instructions came with my pre-production copy of *Road Wars* from Melbourne House, I eventually figured out what I was meant to do. The game is an optional one or two player affair, in which you control a Battlesphere which travels down a vertical-scrolling roadway.

The road has obstacles on it that you have to destroy. And these obstacles emit sparks that will knock out your sphere. But you have a shield for defence and a cannon for attacking, too. Destroy all the panels on the road, and you can progress to the next level.

Although the game is presented using only two colours, the road scrolls beautifully, and the graphics and sound are of a high standard. The only problem I encountered with *Road Wars* was the strange joystick control. Once you are used to this oddity though, the game does become quite addictive.

Keith Neal

BBC

A BOUNDING ELK

Here at last is the promised comparison between the BBC computer and its little brother the Electron, or Elk as it's known to all its friends.

The Electron was launched by Acorn after the Model B had established itself as THE computer for education. Somebody in marketing obviously thought it a good idea to cash in further on parental fears that their children would be left behind in the computer revolution.

Thus, a cheap (£200) version of the BBC, called the Electron, was brought out and recommended for home use. Why the name Electron? Well, first had come the Atom, then the Proton which was later renamed the BBC micro – so little brother Electron was simply in keeping with the tradition of family names. Although claims had it running virtually all BBC software, closer examination revealed a host of differences between the siblings.

THE DIFFERENCES

The Electron has no teletext MODE 7 where a colour screen takes up only 1K of RAM. Instead it defaults to monochrome MODE 6 which takes up 8K, so any large program which relies on MODE 7 on the BBC will not run.

Also if a program happens to be small enough to run, the colour codes appear on the screen as redefined characters producing a somewhat messy display.

In MODES 0,1,2 and 3 the Elk runs at just over 50 per cent of a BBC's speed, although it is only slightly slower in MODES 4, 5 and 6.

CONTINUING...

The BBC has four-channel sound with full control over waveforms (via the ENVELOPE command). The Electron has only one sound channel. Thus, it can produce a wide variety of sounds but not as many as the BBC. Indeed, BBC music will sound poor on the Electron.

In an effort to reduce production costs, Acorn did not provide a printer, 1MHz BUS, user, disk drive, or analogue to digital conversion ports. Acorn did provide an expansion port where both the data and address bus were available. This meant that the computer could be upgraded to almost the same specification as a BBC Micro.

There are disk drive interfaces, MODE 7 units, four-channel sound units, ROM cartridge ports, printer ports and an analogue to digital converter. Even the speed could be beefed up with a second processor or Turbo board.

DOWN TO CHIPS

The BBC custom chip set was replaced by an all-in-one chip on the Electron. This difference means that programs which rely on smooth hardware scrolling on the BBC do not look too good on the Electron. What is more, there are other differences between the two machines but the aforementioned stand out as being the most important, particularly from a programming viewpoint.

But remember the competition at the time, such as the Oric Atmos, Lynx Computer, or even the ZX Spectrum, and the Electron shines out.

Andrew Brown

CPC

CHRIMBO NUMBER ONE?

As usual at this time of year, the software houses have been churning out new games by the bucketload. And, also as usual, bets are being placed on what's going to make the number one slot. What do you figure?

The highly personal Lawton resumé is as follows: *Untouchables* – too blue; *Ghostbusters II* – didn't like the film; *Hard Drivin'* – only two courses; *Batman* – horrible restart position; *Operation Thunderbolt* – too bloodthirsty; *Moonwalker* – too wierd; *Turbo Out Run* – too dull; *Ghouls 'n' Ghosts* – too old; *Altered Beast* – too slow; *Cabal* – looked like a Speccy port (say no more); *Pictionary* – to expensive; *Tintin on the Moon* – too shallow (fussy devil, aren't I?)...

And the winner? Well, it just had to be *Power Drift*. No real pretence at gameplay, often dubious collision detection and some Escher-esque circuits that looked highly improbable to say the least... and yet it is so very playable.

Honourable mention for the best game of the year goes to Blade Software's *Laser Squad*. Great graphics, a combination arcade action with strategy war-gaming and more gameplay than you could possibly exhaust, make it the best entertainment of the year.

ALTERNATIVE CLASSICS

Some deep part of the Lawton persona still clings to the notion that there are certain games that possess a timeless appeal which transcends astonishingly primeval graphics and vestigial gameplay. And this phenomenon explains my initial scepticism at Alternative's budget compilation *Classical Arcadia*, and it also explains why that scepticism gave way to grudging respect and then to total addiction. There are three games on the compilation, which sells for a paltry £1.99.

Invaders is a *Space Invaders* lookalike (no surprises there), that features the same blend of simplistic blasting and multitude of mindless opponents. Even the constant slow drumming as the alien hordes march across the screen is there, together with that subtle but infinitely menacing shift in frequency as the merciless mutants grow ever fewer in number but ever more vicious in temperament. Even newcomers to the game will suffer sweaty palms as the last invader scoots from side to side, thrumming away and dropping lightning-fast laser bolts...

Phew. Almost a relief then to play *Muncher*, a *Pacman*-clone that sacrifices the screen size of the original but otherwise duplicates its pace and character admirably. Never much of a fan of that one, though.

Finally, there's *Axiens*, which remains faithful to the spirit of the arcade original *Galaxians*. You get the same hordes of aliens, the same groups of three splitting off from the main body and screeching down at you like little Stukas, and the same hailstorms of fire as you blast the little beggars to oblivion before they do the same to you.

For £1.99, the *Classic Arcadia* is more than reasonable, in fact, one might say that it is a bargain.

Rod Lawton

LAUGHING CABAL-EER

Hacker Phil Howard has come up with a tape poke to give players of Ocean's jolly *Op Wolf*-type *Cabal* inifinite lives.

```
1 'CABAL
2 '
3 'INFINITE LIVES.
4 '
10 DATA 21,16,BD,36,C3,23
20 DATA 36,0E,23,36,BE,C3
30 DATA 8A,9A,21,17,BE,22
40 DATA 4e,A6,C3,08,A6,DD
50 DATA 21,b8,A8,11,B0,00
60 DATA CD,47,A8,21,2A,BE
70 DATA 22,66,a9,C3,e2,a8
80 DATA 3e,00,32,72,19,c3
90 DATA 00,01
100 y=0:MEMORY &5000
110 FOR x=&BE00 TO &BE31
120 READ a$:a=VAL("&"+a$)
130 POKE x,a:y=y+a:NEXT
140 IF y<>&13F0 THEN 170
150 LOAD"CABAL
160 CALL &BE00
170 PRINT"data error!"
```

TYPE-IN TIME

Here's a jolly little Christmas type-in from David Hooper of Plymouth. It only works on 6128s alas, so 464 owners need not read on

```
10 REM WORM. By David Hooper.
20 INK 0,0:INK 1,15:INK 2,9:BOR     DER 0:MODE 1:PEN 2
30 LOCATE 1,20:PRINT STRING$(240,CHR$(143));
40 FOR h=0 TO 100:PLOT RND*640,RND*96,0:NEXT
50 GRAPHICS PEN 1
60 n=100:sp=4+RND*4
70 SYMBOL 240,0,0,0,0,127,149,127,0
80 SYMBOL 241,0,0,0,12,242,82,252,0
90 SYMBOL 242,0,0,0,31,106,159,96,0
100 SYMBOL 243,0,0,0,204,178,210,60,0
110 SYMBOL 244,0,0,30,43,102,145,96,0
120 SYMBOL 245,0,0,0,204,178,210,60,0
130 k=240:TAG
140 GOSUB 170:k=242:GOSUB 170:k=244:GOSUB 170:k=242:GOSUB 170:k=240
150 IF h>640 THEN h=-40:sp=4+RND*4
160 GOTO 140
170 MOVE h,110:PRINT " ";CHR$(k);
    CHR$(k+1);:h=h+SP:FOR b=0 TO n:NEXT b
180 RETURN
```

YOUR FORMAT

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AMIGA Data transfer lead **£12.95**
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ATARI dust cover..... **£3.95**
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QL

THE QLUB THAT WAS

Those of you who have acquired your QLs within the last two years or so probably haven't heard of the QL Users Bureau (QLUB, rhyming with club). This organization was Sinclair's own user group for the QL, but it had nothing to do with IQLUG (now QUANTA) which was formed at the same time by Leon Heller and Brian Pain.

QLUB membership used to cost £35 per annum, and it was generally agreed to be rather poor value for money. Benefits included a rather crummy and very occasional newsletter, discounts on hardware and software, and assistance with problems.

Difficulties with the Psion packages were dealt with by Psion representatives, and other hardware/software problems were handled by Sinclair's distribution company, based in Camberley.

The Psion set-up was interesting. A large database was created on a VAX with a quandary of problems and solutions. All queries from users had to be submitted in writing, and one got back a computer printout by return post with a list of potential solutions to the problem.

As I have said, problems with the QL itself were dealt with by a team of people in Camberley, either via the telephone, or in writing. And if memory serves, you didn't have to be 'in the QLUB' to use this service. It worked fairly well – at least in principle.

A SHRINKING MAGAZINE

Focus Magazine's *QL World* seems to be getting smaller and smaller. A year ago it had 60 pages, and it now has 52 slightly smaller pages. Somewhat interestingly, the amount of advertising has stayed the same – at about 22 pages.

On the other hand, this column is still the same size as when it started, just over 10 months ago!

Merry Christmas to all.

John Torofex

ARCHIVE FOR BEGINNERS

Some time ago I mentioned the use of simple one line SuperBASIC procedures to give single key saving of programs, clearing the screen etc. Much the same approach can be adopted when using ARCHIVE. For instance, the following procedure selects the next record and displays it, when the 'n' key is pressed:-

```
proc n
next
display
endproc
```

and

```
proc e
edit
endproc
```

drops you into the editor when 'e' is pressed.

C64

HELPFUL HINTS, 1

Hints for those of you with a cartridge that will allow you to break into a program, poke around, and then re-start.

On *Thunderblade*, if you `POKE 4158,250` and `SYS 4096` to re-start, you'll have 250 helicopters. On *Krakout*, if you `POKE 35220,200` and `SYS 16033` to re-start, you'll have infinite bats. On *Dominator*, if you `POKE 2215,234:POKE 2216,234:POKE 449,2` and `SYS 2177`, you'll not only have infinite lives but you'll also have gained extra speed. Finally, on the curious *Oink*, if you `POKE 39922,165` (infinite rubbish men) `POKE 47774,227` (infinite Tom Thugs) `POKE 31991,227` (infinite pimples) and `SYS 16384` to re-start, you'll have a very interesting game!

HELPFUL HINT, 2

Two helpful hints for those of you who don't have access to a cartridge. On *New Zealand Story*, just press TRY CHEATING (including the space) keys together while on the title screen. The border should turn grey and when you start the game you have infinite kiwis and the ability to skip to the new level by pressing the left-arrow key.

AWARDS FOR 1989

As this is the last *New Computer Express* of the year, some awards are obviously in order. Fanzine of the year has to be *Adventure Probe*, for continued quality throughout this and every other year of its existence.

Game of the year? Well, I haven't played *Chuckie Egg II* yet so I'll give it to *New Zealand Story* (howls of protest – send those letters in).

Hardware supplier? Apart from Commodore of course, I think Star deserves this particular award as it continues to produce very good printers especially the wonderful LC-10 colour printer.

Software company? Tricky, but I would go for Ocean and its dominance of things 64.

Person of the year? Widnes rugby league player Jonathan Davies for being brilliant at what he does (and I don't support Widnes!).

HANDY HAREWARE?

As most Commodore 64's are sold with a cassette deck bundled in these days, marketing another cassette deck which is C64 compatible might seem like a strange idea. But Mills Computer Products does just that, at £39.99.

The deck features adjustable head alignment and LEDs to indicate maximum signal position. This allows you to watch pretty lights while the program's loading! Mills also promises 'first time loading – every time'. Hmmm.

Anyway, contact the good people at Chewton Street, Eastwood, Nottingham NG16 3HB if you're interested.

Pete Gerrard

XE

AND THE WINNER IS...

Remember the competition set in *Express* issue 57? I've had a surprising number of entries, but a winner had to be chosen. So, I applied the ubiquitous 'first out of the hat' method and came up with (rustle of golden envelope being torn open, murmur of anticipation from the assembled...) Mr D. Hyde of Tay Vale, Suffolk who wins the flight simulator. Well done D. Hyde.

If competitions are going to attract attention from readers of this column at these levels, then perhaps they'll be made a regular feature of the column. Please write and tell me what you think on the matter.

What's that? Oh, the answer... Well, for those still struggling to discover the information, Atari is a Japanese word meaning 'check' (*a là* chess) taken from the game go. The company itself was founded by Nolan Bushnell, Ted Dabney and Larry Bryan in the 1970s.

MERRY CHRISTMAS

It's that time of the year again, kids, and what will the philanthropic old gentleman be bringing to an 8-bit near you for celebration's sake?

Well, before the season's done, I'm hoping to get hold of the desktop publishing packages I talked about a few weeks ago as well as one or two goodies on order from the States. All will be revealed and reviewed after Christmas.

Merry Christmas and I'll see you all next year.

Edmund Blake.

ARCHIMEDES

SHOPPING EXTRAVAGANZA

For the last column of the year the Carrot would like to take you on a quick trip down the Arc shopping arcade, presenting a few alternatives for the last minute or belated gift purchase.

THE 4TH DIMENSION

This Sheffield-based games specialist has two more out for Christmas, in addition to *Arcade Soccer*, reviewed a few weeks back. *E-Type* is receiving the most acclaim as a rival to *Outrun* (which, incidentally, is itself rumoured for release early in 1990).

E-Type, a road race game with excellent graphics, good British star car – none of this Testarossa rubbish – a separate track disk (*Extra 100 Miles*) and another utility for designing your own tracks, provides more than ample scope for playing pleasure.

But the other new release, *UIM*, you'll be lucky to pick up before Christmas. This is an *Elite*-style trading and flying game, only the flying is done underwater. With plenty of action and a multitude of places to visit in your 250 missions, you will have difficulty in completing the lot, which you must do in order to earn your swing at the Ultra Intelligent Machine of the title.

CLARES

On the game side, the company is pushing its recently released *Interdictor* flight sim. And as it is the only real flight sim on the Arc, *Interdictor* should be considered a necessary for all home flyers.

On the serious side, and for those with serious money to spend, the Armadeus Sampler Board (£149.95) comes purpose designed for connection to *Armadeus*, Clares' RISCOS-based sampling software (£79.95).

And the new versions of *Artisan*, too numerous to mention, offer some of the best painting facilities on the Arc.

DTPS

Most of the desktop publishing programs are suffering continuous release slippage. The Beebug desktop publishing system release date, for example, seems to move back a month, each month. When it does hit the streets, promises are that it will sport many of the features of the others, at a price rather less than its main competitors.

Coming in at £148.35, it is reported to offer import of *Draw* and *Paint* files, multi-column and linkable text, kerning, scaling and leading, an integral spell-checker and supplied clip-art.

As an alternative, you can buy Acorn's own *DTP* system without delay, today, for £171.35 or Computer Concept's *Impression* for the same price, tomorrow, or perhaps next week. I have yet to receive the upgrade from the preliminary version issued a few months ago.

MINERVA

One of the most dedicated supporters of the Arc, Minerva is selling *MultiStore* for the princely sum of £299. As a well-featured relational database, RISCOS-based and with full graphics handling.

Not only will *MultiStore* multi-task through RISCOS with other Arc applications, but it multi-tasks internally, working on several files at once if you need. There's a lot in there, but at a PC-style price. Come to think of it, though, why shouldn't complex software written for a multi-tasking machine demand this kind of price?

MORE MEMORY

Not everything you may be considering will be in the software department, of course. With the increasing use of multi-tasking software, 1Mb of memory is becoming increasingly tight.

Beware that it's now customary for suppliers to quote memory increases to a given capacity. A 2Mb upgrade for an A3000 or A310, for example, only provides an extra 1Mb in new chips...

Of those available for the A310, the harder machine to upgrade, that from CJE Micros seems to be well received. I've heard that the Watford Electronics upgrade can stress an A310 power supply, but I have yet to have one to test, so I can't comment objectively. All A310 upgrades are sensibly only dealer fitting, as they involve connections to several of the key chips on the main board.

PUN FUN

When will the silly puns cease: 'Freddie Star ate my Armster'?

Bertrum Carrot

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THE SHOPPING EXPRESS BUYERS' GUIDE TO PRINTERS, MODEMS & PORTABLES

The first peripheral most people buy is a printer – a word processor is pretty useless without one! Here we present the Express guide to dot-matrix printers, together with some advice on portables and modems

PRINTERS

Every computer owner needs a printer. From the largest corporate business to the smallest home user the time will come when you need more than what's shown on screen, you'll need hard copy.

● AMSTRAD DMP4000

0279 454555
£349
9-pin • 200cps draft 50cps NLQ • 8K buffer • Epson compatible

Bottom of the usable range Amstrad printer, which is unsophisticated, provides only adequate printing quality and which is expensive when compared with similarly-specified machines from other manufacturers. The device is both Epson and IBM compatible.

Power ★★★

Value for money ★★

● AMSTRAD LQ3500

0279 454555
£349
24-pin • 160cps draft 54cps NLQ • 8K buffer • Epson compatible

Amstrad's wierd and wonderful pricing structure has ensured that this 24-pin printer offering roughly similar specifications to the DMP400 but a vastly improved print quality is the same price – and you can find good discount deals. 160cps draft speed for a 24-pin dot matrix machine is outrageously slow and the 8K buffer doesn't excite thrills of desire.

Power ★★

Value for money ★★★

● AMSTRAD LQ5000

0279 454555
£449
24-pin • 288cps draft 96cps NLQ • 8K buffer • Epson compatible

One of the best from the Amstrad stable. Featuring reasonable print speeds, a wide carriage and built in tractor feed as standard, the machine is worthy of consideration by small business persons.

Power ★★★★

Value for money ★★★

● BROTHER 1109

061-330 6531
£195
9-pin • 100cps draft 20cps NLQ • No buffer • Epson compatible

Expensive, underspecified printer from well-known manufacturer Brother who really needs to try harder. Almost £200 for a printer which doesn't have a printer buffer indeed!

Power ★

Value for money ★

● BULL COMPUPRINT 4/20

01-568 9191
From £440
9-pin • 200cps draft 40cps NLQ • 7K buffer • Not Epson compatible

Available in a choice of carriage widths and optional serial or parallel interface, the Bull machine is an incredibly expensive, deathly ordinary dot matrix with little to recommend it. Unless you're a corporate buyer with the name Bull indelibly marked on your purchasing order forms, look elsewhere....

Power ★★★

Value for money ★

● CITIZEN HQP-40

0895 72621
£499
24-pin • 200cps draft 66cps NLQ • No buffer • Epson compatible

Citizen have been in the printer business for a number of years and although some of the company's early machines were a little strange, the latest printers are worthy of consideration. The HQP-40 is a fairly expensive, but well made 24-pin printer – but the lack of print buffer should be noted.

Power ★★★

Value for money ★★

● EPSON LX-850

0442 61144
£279
9-pin • 180cps draft 30cps NLQ • 3K buffer

Bottom of the range Epson 9-pin machine featuring two NLQ fonts, only moderate print quality but the great name Epson on the panel.

Power ★

Value for money ★

● EPSON EX-800

0442 61144
£629
9-pin • 300cps draft 60cps NLQ • 8K buffer

Epson is *the* name in the printer world. The company whose printer control codes have been adopted as an unofficial standard by almost all other manufacturers. The company's printers are well made, available everywhere and supported by all software. However, the popularity of Epson has ensured the price of the machines has remained inflated when compared with similarly-specified machines from other manufacturers. The EX-800 is fast, and of high quality construction. A optional colour adapter is available.

Power ★★★★

Value for money ★★★

● EPSON LQ550

0442 61144
£399
24-pin • 150cps draft 50cps NLQ • No buffer

Uninspiring 24-pin mid-range printer from Epson. Four built-in letter-quality fonts, friction and tractor paper handling and good quality printing.

Power ★★★

Value for money ★★★

● EPSON FX850

0442 61144
£459
9-pin • 264cps draft 54cps NLQ • 8K buffer

Fast but fairly expensive 9-pin machine featuring innovative cut sheet and fan fold paper handling, quality printing, and fast draft mode.

Power ★★★★

Value for money ★★★

● EPSON EX1000

0442 61144
£829
9-pin • 300cps draft 60cps NLQ • 8K buffer

One of the top of the range Epson 9-pin machines which has a fast draft printing mode, but has a tendency to lose the paper feed after 20 or 30 sheets have been processed. First choice for professional programmers needing listings.

Power ★★★★

Value for money ★★★

● EPSON DFX5000

0442 61144
£1,699
9-pin • 533cps draft 96cps NLQ • 3K buffer

➤

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Includes: TV modulator, 3.5" Disk Drive with Amiga DOS Kickstart, Workbench and Batman The Movie game, F18 Inceptor, Paint 2, New Zealand Story, + Free mouse mat or joystick.

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Amiga A501 RAM pack + Clock.....£99
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TV Modulator.....£15
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Phillips BM7502 12" green monitor.....£79
Phillips BM7522 12" amber monitor.....£89
Amiga To Philips cable.....£8

AMIGA DRIVE

1 Meg 3.5" external.....£68
1 Meg 3.5" internal.....£63
1 Meg 5.25" external.....£99

ATARI COMPUTERS

520 STFM Explorer Pack.....£248
520 STFM Super Pack.....£248
520 STFM Power Pack,.....£309
1040 STFM Super Pack.....£389
SM124 mono monitor.....£99
CS1224 colour monitor.....£229

ATARI DRIVES

1 Meg 3.5 external.....£68
1 Meg 5.25 external.....£99
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STAR PRINTERS

Star LC10 mono.....£135
Star LC10 colour.....£168
Star 2410.....£225
Star LC15 9 Pin 136 column.....£264
Star LC2415 24 Pin.....£328

PANASONIC
Unbeatable Prices!

Panasonic 1081.....£125
KXP 1124.....£229
KXP 1180.....£144

CITIZEN PRINTERS

Citizen 120D.....£115
Citizen 180E.....£127
Swift 24.....£255
Colour upgrade for Swift.....£42

MANNESMAN TALLY

Mannesman MT 81 Dot Matrix.....£115
Mannesman Sheetfeeder.....£62
Mannesman Serial Interface.....£49

REPAIRS FOR AMIGA AND ATARI

If you want a mega-fast printer this is your baby. At 533 characters per second in draft, this machine is the fastest of the Epson range. 96 characters in NLQ mode is fairly racing along too!

Power ★★★★★

Value for money ★

● IBM PROPRINTER III

01 747 0747
£442
9-pin • 320cps draft 65cps NLQ • 32K buffer

Fast, and with a huge print buffer and reasonable price tag (when compared with similar machines from Epson and Amstrad) the IBM is the first choice for the corporate buyer.

Power ★★★★

Value for money ★★★★

● IBM QUIETWRITER III

01 747 0747
£1,139
274cps draft 171cps NLQ • No buffer

Calling migraine sufferers everywhere! The Quietwriter III from IBM relies on thermal technology to provide whisper quiet operation at at a fast printing speed.

Power ★★★

Value for money ★★★

● MICRO PERIPHERALS MP165+

0706 217799
£198
9-pin • 190cps draft 32cps NLQ • No buffer • Epson compatible

Bottom of usable range Micro Peripherals printer which provides reasonable print quality and speed at a moderate price. Many dealers offer large discounts.

Power ★★

Value for money ★★★★

● MICRO PERIPHERALSMP200+

0706 217799
£299
pin • 240cps draft 40cps NLQ • buffer • Epson compatible

Fast, moderately priced printer which can accept a range of plug-in font cards ensuring the versatility of the printer. Good deals to be had.

Power ★★★

Value for money ★★★

● OLIVETTI DM250

0908 374900
£649
24-pin 180cps draft 60cps NLQ
24K buffer Epson compatible

Good quality printer from erstwhile typewriter manufacturer Olivetti. This device features a large print buffer and moderate printing speed. However, the price tag is just a little on the large side.

Power ★★

Value for money ★★

● OLIVETTI DM100/105

0908 374900
From £235
9-pin • 120cps draft 25cps NLQ • 7K buffer • Epson compatible

Unpretentious little matrix machine from Olivetti which can also be had in a colour version (DM105).

Power ★★

Value for money ★★

● PANASONIC KXP1081

0344 853915
£219
9-pin • 180cps draft 24cps NLQ • 1K buffer Epson compatible

Very popular do matrix printer from well-known manufacturer Panasonic. Reasonably specified, fully Epson compatible and available discounted at a price which will take your breath away this machine is the first choice for prospective printer purchasers with limited budgets.

Power ★★★

Value for money ★★★★★

● STAR LC10

0494 471111
£199 (mono), £259 (colour)
9-pin • 144cps draft 36cps NLQ • 4K buffer • Epson compatible

Like the Panasonic KXP1081, the LC10 from Star is a very popular, highly desirable dot matrix, featuring good specifications, full Epson compatiblility and a colour option all at a breath-takingly small (discounted) price.

Power ★★

Value for money ★★★★★

PORTABLE COMPUTERS

There's never been a better time to buy a portable computer. Advances in technology, the breaching of the PC compatibles market by Amstrad and the price wars of the major manufacturers have all ensured that you can buy a pocket or laptop computer with processing power which previously would have occupied a room...

➤

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MANNESMANN TALLY MT81 PRINTER

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- Includes cable

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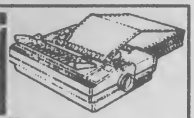
CITIZEN Swift 24



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Space Ace	£28.95
Corvette	£20.95
Oliver	£12.95
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Turbo Outrun	£13.95
Chambers/Shaolin	£15.95
Strider	£16.95
Kenny Dalglish	£12.95
Moonwalker	£13.95
Ghouls N Ghosts	£13.95
Paul Gascoign	£15.95
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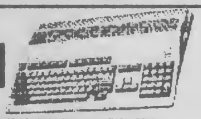
Amiga



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All Star prices include VAT, parrallel lead, delivery and 12 Months On Site Warranty

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14 pin din plug (ST disk drive)	£2.25
14 pin din socket (ST disk drive)	£2.95
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C64 reset switch	£5.95

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● AMSTRAD PPC512

0279 454555
£499
8086 CPU • LCD CGA screen • 512K RAM • Single/twin floppy drive(s)

Amstrad has a finger in every pie and the portable PC compatible market is no exception. The entry level machine is the PPC512, featuring a full sized keyboard, but poor screen, not much memory and not much else to recommend it. Look elsewhere...

Power ★★

Value for money ★★

● AMSTRAD PPC640

0279 454555
£799
8086 CPU • LCD CGA screen • 640K RAM • Double drives • Internal V21, V22, V22bis, V23 modem

When first launched, the media recommended the machine as being worth the price for the built-in modem alone. Although quite large and not very pretty, the Amstrad is nonetheless a very usable portable computer at a fantastically low price. Very worthy of your consideration and money.

Power ★★★★★

Value for money ★★★★★

● BULL PC AP-L

0422 212781
From £1,395
80286 CPU • 1Mb RAM • 20/40Mb hard drive

Fast, comparitively lightweight portable from Bull, featuring a megabyte of RAM and choice of hard drives. Screen display reasonable.

Power ★★★

Value for money ★★★

● COMPAQ PORTABLE II

01 940 8860
From £2,395
80286 CPU • 640K RAM • 20Mb hard drive • 360K floppy

Expensive, under-specified, portable from a dealer with a reputation for high quality and matching high prices. Compaq machines are rugged, but demand fat wallets.

Power ★★★

Value for money ★★

● COMPAQ PORTABLE III

01 940 8860
From £2,995
80386 CPU • 640K RAM • 20/40Mb hard drive • 1.2Mb floppy

Mid range Compaq 386-based portable featuring a choice of drives but lacking sufficient RAM for a machine of these specifications – why cut corners? Reasonable screen display and rugged construction.

Power ★★★★

Value for money ★★

● COMPAQ PORTABLE 386

01 940 8860
From £4,695
80386 CPU • 1Mb RAM • 40/100Mb hard drive 1.2Mb floppy

Top of the range Compaq portable with an optional 100Mb hard drive for those seeking power computing with a capital P. Also featuring a 1.2Mb floppy and a full megabyte of RAM.

Power ★★★★

Value for money ★★★★

● COMTECH TECHNOLOGY 286LT

0964 615100
From £1,995
80286 CPU • 1Mb RAM • 32Mb hard drive • 1.44Mb floppy

Portable from Comtech UK with the unusual distinction of having a gas plasma rather than LCD display. Plenty of features such as high density 3.5-inch drive and 32Mb hard drive ensure the desirability of this machine.

Power ★★★★

Value for money ★★★

● EPSON PC AX

0442 61144
£2,749
80286 CPU • 640K RAM • 20Mb hard drive

Very popular and well made portable from printer manufacturer Epson. The PC AX features a paper white monitor and is light and very portable.

Power ★★★

Value for money ★★★

● EPSON FD

0442 61144
£1,199
V30 CPU • 640K RAM • Single/twin floppies

One of the cheaper Epson portables but still with a heavy price tag this machine features a fast V30 central processor and is available with a choice of floppy drives (also available in a hard drive 'HD' version).

Power ★★

Value for money ★★

➤

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9 PIN PRINTER INC LEAD

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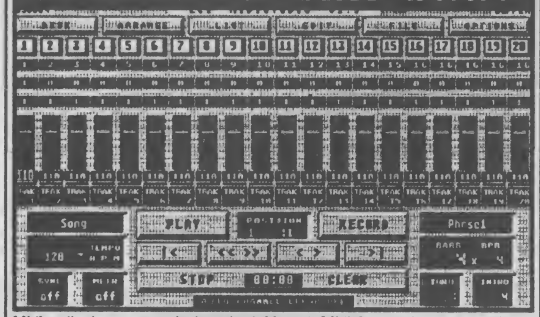

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DD COLOUR	£775
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COLOUR	£1189
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COLOUR	£982
EGA COLOUR	£1137

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MONO	£1240
COLOUR	£1396
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MONO	£1650
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PC1000-8088 512K SD	£499	£799
PC2000-8088 640K HD20	£799	£1079
PC100-8088 640K S/D	£399	£599
PC100-8088 640K HD30	£659	£899
MINI-S 640K S/D	£479	£779
MINI-D 640K D/D	£499	£799
MINI-H 640K HD20	£899	£1199
AT286-10 640K S/D	£799	£1099
AT286-10 640K HD30	£1099	£1359
AT286-16 1MB S/D VGA		£1399
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AT386-16 1MB S/D	£1199	
AT386-16 1MB HD40	£1549	
AT386-20 4MB S/D VGA		£2229
AT386-20 4MB HD40 VGA		£2559
AT386-20 4MB HD80 VGA		£2999

SCHNEIDER

MODEL	MON	COL	EGA
EURO PC	£349	£489	
EURO AT 512K S/D	£675	£805	£890
EURO AT 512K D/D	£765	£895	£980
EURO AT 1MB S/D	£761	£891	£976
EURO AT 1MB D/D	£851	£981	£1066
EURO AT 512K H/D	£975	£1105	£1190
EURO AT 1MB H/D	£1061	£1191	£1276

Schneider Accessories

3.5" External Drive	£72
5.25" External Drive	£99
20Mb External Hard Disk	£269
40Mb External Hard Disk	£379
Monitor Stand	£14

All Schneider PC's & AT's include Microsoft Works, DOS & Manuals + 12 months on-site warranty.

COMMODORE

MODEL	MON	COL	EGA
PC/XT COMPATIBLE			
PC10 III-S/D 640K	£444	£566	£687
PC10 III-D/D 640K	£497	£621	£746
PC10 Bundles inc. Framework, mouse & MPS 1230 Printer			
PC10-D/D	£740	£896	£1013
PC10-HD40MB	£896	£1013	£1130
PC20 III-HD 640K	£631	£749	£868
PC30-286HD 640K	£935	£1052	£1130
AT80286 COMPATIBLE - VGA'S			
PC40-40MB 1 MB	£1291	£1462	
PC40 + TAPE	£1559	£1759	

Includes 12 months on-site warranty

PORTABLES

MAKE	MODEL	PRICE
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AMSTRAD + Phone	PPC512D	£467
AMSTRAD + Phone	PPC640S	£445
AMSTRAD + Phone	PPC640D	£552
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SHARP	4641	£1463
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SHARP	7221	£1699
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AKHTER 286-3200	20MB	£1695
SCHNEIDER	PC7640	£1418
SAMSUNG S5200	32MB-AT	£1693
VICTOR V286P	30MB	£2499

AMSTRAD

MODEL	MON	COL	EGA
PCW8256	£310		
PCW8512	£395		
PCW9512	£424		
PC1512SD	£360	£437	
PC1512DD	£437	£513	
PC1640SD	£451	£536	£621
PC1640DD	£512	£597	£682
PC1640HD	£682	£768	£853

	Mono	Col	12"	14"
PC1286SD	£750	£835	£920	£1005
PC1386SD	£1180	£1265	£1351	£1436
PC2086SD +SOFT	£531	£617	£702	£787
PC2086DD + SOFT	£595	£680	£765	£851
PC2086HD + SOFT	£765	£851	£936	£1021
PC2286DD	£851	£936	£1021	£1106
PC2286HD	£1021	£1106	£1191	£1276
PC2386HD	£1702	£1787	£1872	£1957

All genuine models not upgraded in any way

HYUNDAI

Note, Base units only. Monitors are separate.

Model	Mono	Col	EGA	VGA
SUPER 16-TE PC/XT 640K 10Mhz Metal Case				
Super 16-TE S/D	£361	£361	£455	£511
Super 16-TE D/D	£430	£430	£524	£580
Super 16-TE HD30	£561	£561	£655	£711
286C 8/10MHZ 512K RAM				
286 S/D	£749	£749	£749	£859
286 HD30	£949	£949	£949	£1059
386SX 8/16 Mhz 1MB RAM				
386 S/D	£959	£959	£959	£1069
386 HD30	£1159	£1159	£1159	£1269
386C 8/20 Mhz No Wait States 1MB RAM VGA				
386C S/D	£1279	£1279	£1279	£1279
386C HD40	£1599	£1599	£1599	£1599

SAMSUNG

Model	Mono	CGA	EGA
All the following Systems are without Monitors. Please refer to monitor box.			
PC/XT			
SPC3000/1 S/D	£405	£405	
SPC3000/2 D/D	£473	£474	
SPC3000/3 HD20	£677	£677	
AT80286 10Mhz			
MFC6000/1 S/D	£812	£812	
MFC6000/2 S/D	£1015	£1015	
SPC6500/3 HD20	£1151	£1151	
AT80286 12Mhz 1MB VGA			
SPC6512/1 S/D	£1015	£1015	
SPC6512/3 HD20	£1219	£1219	
SPC6512/4 HD40	£1354	£1354	
AT80386 20Mhz 2MB EGA			
S800 D/D	£1693	£1693	£1693

All Samsung Computers include 12 months on-site maintenance.

MITAC

Model	Mono	Col	EGA
88 512K	£586		
88 20MB HD	£790		£1102
1000L PS/2	£730	£930	VGA'S
1000L PS/2	£963	£1163	VGA'S
286SL HD20	£1030	£1209	£1332
286SL HD42	£1163	£1342	£1465
286V HD42	£1463	£1663	VGA'S
286V HD102	£1930	£2130	VGA'S
286VE HD42	£1596	£1796	VGA'S
286VE HD10	£2063	£2263	VGA'S
386 HD42	£2330	£2568	VGA'S
386 HD102	£2796	£3130	VGA'S

All MITAC Systems come complete with 12 Months on-site warranty.

VICTOR

MODEL	MON	COL	EGA	VGA
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VPCIIC D/D	£1099	£1299	£1549	£1599
VPCIIC HD30	£1499	£1699	£1949	£1999
V286C S/D	£999		£1299	£1499
V286C D/D	£1499		£1799	£1999
V286C HD30	£1999		£2299	£2499
V286C HD50	£2199		£2499	£2699
V286A HD30	£2099		£2549	£2599
V286A HD50	£2299		£2749	£2799
V286S HD50	£2499		£2949	£2999
V286S HD70	£2699		£3149	£3199
V386S HD50	£3299		£3749	£3799
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V386S HD230	£5299		£5749	£5799
V386T HD70	£5999		£6449	£6499
V386T HD230	£7699		£8149	£8199
30MB ADD-PAK	£399			

MONITORS

MAKE	12" Mon	14" Mon	14" CGA	14" EGA	Mono VGA	Colour VGA	Multi Sync
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	7513 £77		9043 £261	9043 £261		9809 £374	
	7913 £81		9053 £296	9053 £296			
SAMSUNG	2573 £76	4573 £85		4531 £299	2611 £85	4531 £299	4551 £397
AMSTRAD	12MD £119		14CD £199		12HRCD £294	14HRCD £383	
AKHTER	ACL12G £60	ACL14G £85	VISION £199	ACL-3 £259	ACL-VM £110	ACL-V £289	ACL-M £355
HITACHI						480 AUTO £358	

Notice: All Samsung Monitors come with 12 Months on-site maintenance

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MODEL	PRICE
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Competition Pro Extra Joystick	£10.59
Philips CM8833 Colour/Stereo	£199
Atari SM124 High Res Mono	£115

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30Mb Hard Card 2 yr Warranty	£195
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STAR FR10 ★	300/76	£289
STAR FR15 ★	300/56	£379
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STAR LC24-15	200/67	£319
STAR XB24-10 ★	240/80	£375
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STAR LASER 8 ★	8PPM	£1198
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KXP 1180	192/36	£144
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KXP 1124	192/63	£220
KXP 1540	288/65	£400
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120D PAR	120/25	£102
120D SER	120/25	£119
180E PAR	175/30	£123
180E SER	175/30	£149
MSP15E	160/40	£164
MSP40	240/40	£199
MSP45	240/40	£239
MSP50	300/60	£285
MSP55	300/60	£399
24 PIN DOT MATRIX		
HQP 40	200/65	£259
SWIFT 24	160/60	£245
LASER PRINTERS		
OVERTURE 106	6PPM	£930
OVERTURE 112	12PPM	£1289

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MAKE	SPEED	PRICE
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LX850	240/48	£178
FX850	264/54	£351
FX1050	240/48	£293
EX800	300/60	£402
EX1000	300/60	£530
DFX5000	533/400	£1087
LQ400	180/60	£189
LQ550	180/60	£255
LQ850	264/88	£394
LQ1050	264/88	£543
LQ860	290/88	£499
LQ1060	290/88	£639
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SQ850	600/198	£575
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QUIET JET +		£398
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DESK JET +		£519
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LASER JET II	8PPM	£1248
LASER JET IID	8PPM	£1879

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OLIVETTI

MODEL	SPEED	PRICE
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DM105SPR Colour	200/30	£154
DM282	240/40	£216
DM282S	240/40	£245
DM292S 136 col	240/40	£307
DM250	240/60	£402
DM250L 136 col	240/60	£458
DM400 136 col	400/100	£867
DM704 136 col	400/100	£1053
DM309	360/66	£269
DM309L 136 col	360/66	£356
LASER PRINTERS		
PG 306 ★	6PPM	£899
PG 208 ★	8PPM	£1199
PG 303 ★ Postscript	8PPM	£2595

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MODEL	SPEED	PRICE
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CANON LBP8 III	8PPM	£1390
CANON LBP8 IIIT	Dual Bin	£1815
CANON LBP8 IIIR	Duplex	£1923
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CANON IX-31F Scanner Int/face		£113
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MT905	6PPM	£889
SHARP JX-9300	6PPM	£1063
KYOCERA F1000	10PPM	£1459
KYOCERA F1200	10PPM	£2369
KYOCERA F2200S	10PPM	£2569
KYOCERA P2000	10PPM	£3969
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BROTHER HL-8D	8PPM	£2189
BROTHER HL-8PS	8PPM	£2524
BROTHER HL-8QS	8PPM	£2929

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Hyundai-920 15"	216/37	£199
ACL 135 10"	135/27	£119
ACL 480 10"	480/55	£299
ACL 700 15"	480/55	£399
18 PIN DOT MATRIX PRINTERS		
Hyundai 1810 10"	240/100	£229
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RIBBONS	BLACK	COLOUR
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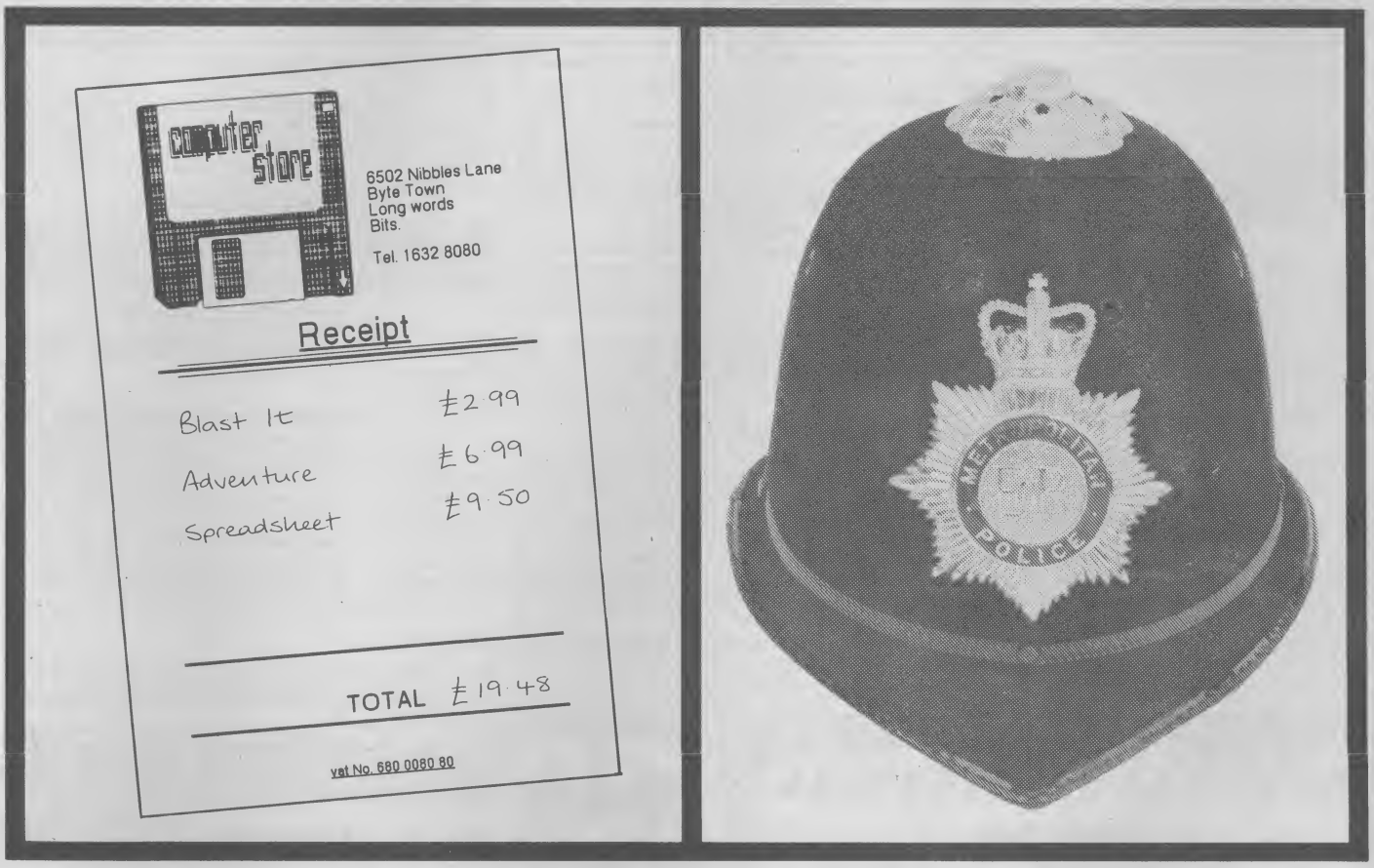

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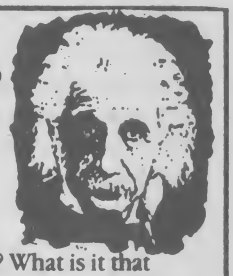

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ON THE AGENDA

The new Agenda and the recent Psion LZ are two more contenders in the personal organiser market. How do they fit your pocket? Neil Booth has his hands full...

AGENDA

£195 (32K), £245 (64K)
MICROWRITER SYSTEMS
01-685 0300

The organiser market is getting more and more crowded these days. The Agenda is the latest competitor in the pocket stakes, and comes from Microwriter Systems. Its previous machine, the Microwriter, was a hand-held electronic notebook which you typed into by pressing combinations of a five-key keyboard, with different letters having different combinations. Though claimed to be easy to learn, the new organiser has an alphabetic keyboard (ABC instead of QWERTY) as well as the five-key system for those moving up from the Microwriter.

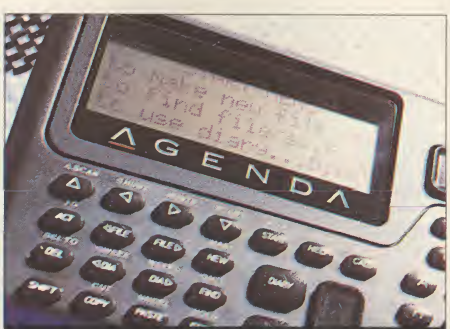
The four-line by 20-character screen is the rather pokey little window on the world of your information. The Agenda stores things in the form of a card index database ordered by the first line. You can have up to 23 separate databases. Each card is called a 'file' and can be anything from a name and address to pages of text. You can select certain files by specifying a word or sequence of letters, and the Agenda automatically selects the entries containing that sequence somewhere in the first 100 letters.

Entry is all very easy and the system is fine for looking up addresses of your London customers or that chap's telephone number, Dave something, wasn't it...? However it's all very threadbare compared to even the simplest proper database, and because it works on simple unkeyed string searches, can take an annoying few seconds on large files. Data can be backed up on a cartridge and the 32K is enough to store hundreds of names and addresses.

There is a calculator, diary, alarm function and daily 'action list' storing the things you've got to do that day. The Agenda can also be used as a text processor, with bare-bones features like cut and paste. It's not an ideal machine for word processing, despite a macro facility and its ability to control printers and send codes for bold and underline and so on, because of that non-QWERTY keyboard. But for notes, and maybe the shortest of letters, it is fine.

The Microwriter five-key system is said to be 50 per cent faster than handwriting, though it does feel strange. If it was used to put together the generally very good and comprehensive user manual it might explain why the process of using the five-key system is constantly referred to as 'Microwritting'.

It's a nice machine with a quality feel to it, but at the price it's difficult to imagine who would prefer it to the Sharp IQ7000 or the Atari Portfolio. The Sharp is better equipped with built-in utilities, and offers language translator, thesaurus and memory card add-ons for the same price, while the Portfolio, which costs £5 more than the 64K Agenda, is a complete MS-DOS-like pocket computer with 128K RAM, all the built-in software of the Agenda, but better, a bigger screen, a QWERTY keyboard, the ability to run a vast range of programs, etc etc. Basically a nice piece of kit, but at this price, it has to be for Microwriter-literate QWERTophobes on expense accounts only.■



HIGHLIGHTS

- Stylish and well made
- Easy to use and convenient
- Text processor included
- Can make up printer drivers

DRAWBACKS

- Not powerful
- ABC or five-key system
- Expensive for what it does

PSION ORGANISER LZ/LZ 64

£149.95 (LZ), £189.95 (LZ 64)
PSION
01-723 9408

Psion made its name with the pocket organiser. The original versions had a two-line screen but new LZ and LZ 64 have four-line screens, making it not exactly easy to read information, just less difficult.

The Psion works from an opening menu that is divided into functions – diary, time, alarm and so on — and is rather easier to find your way around from cold than is the Agenda. The database, like the Agenda, stores your names and addresses as strings and does searches and selections on the basis of text appearing in the entry – select on 'London' and you get all the people who live in London, as well as anyone in London Road, anyone called Brian London, or anyone who lives in Londonderry.

All text is restricted to upper case, but that doesn't matter. The keyboard is that irritating ABC style again – though it seems easier to use than the Agenda's.

There are also calculator, diary and alarm functions, and a facility that shows you what time it currently is in dozens of major cities around the world.

The machine is tall and thin, rather than short and squat like the Agenda, and fits rather more easily into your hand. It's easy to use and while not as powerful as even the barest bare-bones database, is useful if you are on the move a lot.

The notepad is another minimalist affair and is sufficient for notes but useless for anything longer; unlike the Agenda it doesn't have cut and paste or support printers.

Where the Psion comes into its own is when you start to use the BASIC-like programming language, OPL. It enables you to write applications that take advantage of all the little widgets you can plug into the Psion, like bar code machines and credit card readers. This is why you'll see the Psion in lots of shop counter applications and stock control situations.

The Psion can be a very useful machine, but for the home user who just wants to keep a few names and addresses with them, the Atari Portfolio looks a better bet. It costs £100 more but offers so much more in the way of screen and keyboard, and that compatibility – after a fashion – with PCs. The four-line screen of the LZ is nice but doesn't do much over the earlier models to improve things.

Overall it's exactly the right machine if you're a small business and need portable stock control, point-of-sale or other data-intensive applications. As a pocket organiser, though, it looks rather rudimentary compared to the Sharp IQ, and as a pocket computer it loses out to the much sexier Portfolio.■

HIGHLIGHTS

- Pleasant and easy to use
- Powerful organiser programming language
- Ideal for stock control
- Bar-code machines, etc. can be tacked on

DRAWBACKS

- As a personnal organiser rather than a business machine, a bit dull
- Outdated compared to newer machines
- Expensive

TECH TIPS

Personal computer problems? Uncle Tech Tip is your man. Write with the agonising details to Tech Tips, Beaufort Court, 30 Monmouth Street, Bath BA1 2AP. Don't forget to tell him which machine you own, as the sorriest story wins a software prize

TIP ROM routine

In reply to the letter from A. Quale of Penzance last week, the OM routine for Lprint is at &H000A5 and the character to be printed should be in the accumulator.

The information he needs is available in *The Red Book*, which has a breakdown of all the MSX ROM routines in great detail. It is published by Kuma.

Another book that is very useful is the *Complete MSX Programmer's Guide*, published by Melbourne House. This has an in-depth guide to the BASIC programming syntax and a smaller section detailing ROM routines, system variable addresses and available hooks (ways of attaching your patch code to the original MSX ROM routine).

If he can't find either of these books, here is a list of some useful routines (all address are in hex):

0094 – Returns a character from the keyboard buffer, storing it in the accumulator

00B7 – Checks to see if Control and Stop are being pressed. The carry flag will be set if they are and cleared if not.

00C3 – Clear screen if the zero flag is set

00D5 – Returns the status of either the cursor keys or the joystick. The accumulator should contain 0 for cursors, 1 for joystick 1 and 2 for joystick 2. The selected direction will then be returned as a value in the accumulator.

00D8 – Returns the status of space or trigger buttons. Input in the accumulator the number of the button to be scanned (0-4) and 255 will be returned if the button is pressed, or 0 if not.

005C – Copies a block of memory into the video RAM. Set the address of the block to be copied in the register pair HL, put the destination address of the block in the register pair DE and the length of the block in registers BC.

008D – Will print a character on the graphics screen at the position of the graphics cursor. Set accumulator to character code.

There are quite a few more useful locations that I know about which I will be happy to pass on if A. Quale gets in touch with me.

K. Holness, 10 The Heath, Whitstable, Kent CT5 3HJ.

BUG OF THE WEEK (well, not quite...)

I have an Atari ST which I use extensively for word processing – almost invariably *1st Word* as it does practically everything I need except spell check (I can't afford *1st Word Plus*) and it's very easy to use.

A couple of days ago it started to give me a hard time. I noticed that the mouse pointer was not always pulling down the menus when pointing at the menu bar. Sometimes it did, sometimes it didn't. It seemed to have a mind of its own. I'd often have to click the left-hand mouse button a few times to activate the menus and for each click, an overline appeared on the screen. This was driving me mad as I was also, at that time, having trouble with the left-hand button on the mouse (where can I buy a new mouse microswitch from?). I was losing whole pages of script as the screen display was seizing up leaving me no option but to reboot, and it actually had me swearing at the computer calling it things like MS-DOS!

I was on the verge of picking the whole caboodle up and flinging it through the television when I noticed that the joystick was still plugged and had been left on auto-fire. I pushed the button back to manual fire and that made all the difference.

Andy Davies, Bideford, Devon.

• Polaris vulgaris – *lives in the control computers of nuclear weapons. Becomes active if the auto-fire is left on on the joystick*

Thanks for pointing out the troubles which can be experienced with auto-fire joysticks. Hardened computer hacks know only too well the problems these devices cause, but you should see the amount of mail I get from sufferers of similar problems. Not quite a bug, but worth fitting in as bug of the week.

HELP! Lunatic PET

In a fit of uncontrolled lunacy I couldn't resist buying an ancient Commodore PET, with a printer and double disk drive, for £15 in the office sale. I now have two requests:

1. Can you reprint the address of the user club for this machine please. I didn't keep it because I never thought I'd need it.

2. I've never used anything but PCs and the Commodore PET is certainly different from the 386 I currently use at work. Don't laugh if this is a stupid question, but could I use it to play Commodore 64 games? There is a cassette recorder built in to the machine.

Mike Ellison, Hebburn, Tyne & Wear.

Lunacy, indeed! The PET was a very usable machine at a time when other micro computers had to be programmed in hex via a 'front panel' and had a row of blinking LEDs as a main display. The Commodore PET is still fairly widely used (a testament to its worth) and there's a thriving user group. Contact them at ICPUG Jack D. Cohen, 30 Brancaster Road, Newbury Park, Ilford IG2 7EP. Telephone 01-346 0050.

As for your second question Mike, it's a nice idea but it just won't work. The Commodore PET is a vastly different animal to the C64, and simply can't use any of the software available for that machine. However, take heart in the knowledge that many reasonable software packages were produced for the PET and the user group will be able to tell you where to get them.

HELP! Monitor mayhem

I have been trying without much success to connect a Yamaha CX5 Mk.2 (MSX) computer to the RGB input of a Ferguson MC01/6175 TV/monitor. I believe the reason that it won't work is that the television expects to see TTL (transistor-transistor logic) signals and the computer sends analogue. Is it possible to match the two together so that I may connect my computer to this monitor?

Now for a tip. I bought the television from DER for £125, which must be one of the cheapest ways of getting a colour monitor and a TV even if I can't use the RGB. DER appear to be clearing them out because they don't have teletext, etc. They do however, have very good picture quality with the advantage that you can have the computer and aerial plugged in at the same time, or run two or three computers (eg, one in the RGB, one in the composite and one in the RF sockets), which is perfect if you are using one computer as an expander and the another as, say, a sequencer.

John Matthews, No Address Supplied.

Although TTL and analogue signals can be made to match one another, this can't be achieved without building a circuit, the scope of which is outside the range of this column. Stick to using the composite input and all will be well. And thanks for the tip. The DER television does indeed provide a quality display at a reasonable price.

HELP! Expensive lesson

After some resistance I have at last been prepared to consider computerising our company accounts. I have glanced at one or two advertisements and noted several uses of the expression 'user-friendly'

My managing director is looking at a package totaling some £2,500 which uses the *Sage Accounts Plus* software at £399.

The supplier wants approximately £420 plus traveling expenses to train a member of my staff to use *Sage Accounts Plus*. Your comments on this please.

Leslie R. K. Gregory, Herne Bay, Kent.

Gosh, the thrills and spills of high finance come to the pages of Tech Tips – it's all terribly exciting!

User-friendly means that the software is designed to be used easily by novice and inexperienced computer users. There will be help obtainable from within the software and all commands will be intuitive. Unfortunately, this happy

state is not always the case, and many software packages are extremely difficult to learn, requiring much poring over heavy and impenetrable texts to get the most from its features.

£420 plus travelling expenses, huh? Extortionate, I'm afraid but probably on a par with the majority of suppliers offering training courses. Besides, better to spend some gelt now and have staff who know what they're doing, rather than investing heavily in a lot of computer equipment which gathers dust because no-one knows how to use it.

Join the 20th century Les. Go silicon, improve your productivity, and relieve the punters of even more of their hard-earned.

HELP! External drive

Do you know of any external one megabyte disk drive for the Atari ST computer where the actual disk drive has identical proportions and power requirements to the half megabyte internal drive, so that I can swap them around?
M. Wilson, Yeovil, Somerset.

The Evesham Micros external one megabyte drive has the same dimensions as that inside the Atari ST's case. You should be able to exchange the one for the other without any problems.

The drive costs a very reasonable £79.95 and can be obtained from Evesham Micros on 0386 765500.

TIP Daisy spares

I read Richard Baynes's request for a source of spares for his GPR2000 daisywheel printer (*Express* 56). I was given to understand some years ago, though I have never had the need to verify this, that the mechanism is the same as that in the Quendata 1120 and Daisystep 2000. If so, he may be able to extend his trawl for spares a little wider.
John R. Hudson, Huddersfield.

HELP! Amiga queries

I have some questions about the Commodore Amiga 500.

1. What is the difference between the *Devpac 2* program and *AMOS*. Does *AMOS* allow users to write programs in machine code?

2. I've heard that there is a book which teaches users all about machine language on the Atari ST (Abacus' *68000*). Is there a similar book for the Amiga?

3. What is a font? And where can I get some from? Do packages such as *Art Studio* have fonts in them?

4. If I write a brilliant program but there is no music (I'm deaf), would a software company accept the code and find a programmer who could add the music?
Roy Ottway, London E2.

1. I think you may be somewhat confused as to what *AMOS* does. *AMOS* is a version of the BASIC programming language that enables you to write stunningly fast and colourful arcade action games without resorting to machine language to achieve the level of speed necessary for a decent game.

Devpac 2 is a machine code monitor, assembler and debugger that enables you to program your Amiga in machine language. It is fast, but as machine language is far more difficult to get to grips with than a high-level language such as BASIC, is not as suitable for games writing as *AMOS* for the novice programmer.

You can market any games which you write using *AMOS* without having to pay royalties to Mandarin Software. So you can create commercial software easily and cheaply, and with only a little programming skill.

2. In fact, the same book. That's right! The Abacus *68000* text book is suitable for any computer with a 68000 central processor at its heart. The book costs around £12 and can be obtained from any high street book store. Although there are other 68000 text books, they tend to be aimed at those programmers who already have an understanding of machine language programming using some other CPU such as the 6502 or Z80.

The Abacus book is pitched squarely at he home enthusiast, keen to learn but with little knowledge.

3. A font is a set of characters which are all in the same style – size, typeface, italic etc. Fonts are used in books, magazines, newspapers etc., and particular fonts are chosen for specific tasks. Bold, aggressive fonts for headlines, soft, inviting fonts for persuasive advertising and so on. Word processors, desktop publishing packages, art and graphics programs such as *Art Studio* and others all come with a certain number of fonts for use with your own creations. Used sparingly and sensibly, different fonts can add significant appeal to your documents.

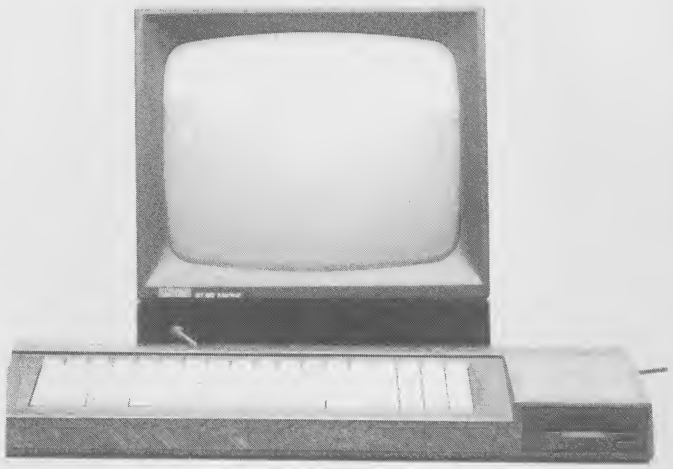
4. Of course! If you have, or are about to, pen the definitive arcade, strategy or adventure game then get it sent off to a software house or talk to them about your ideas. Most software houses provide in-house sound expertise in the form of jobbing musicians who can add the necessary chirps and warblings to your games. Don't delay – send today.

TIP One reader's double trouble with a Plus 3 printer problem

Having read Tech Tips I have discovered a piece of misleading information about the humble old Spectrum. The letter headed 'FED Twice' refers to a problem with the ROM routine which deals with the strobe line to a Centronics printer.

I too have the problem of a permanent extra line feed and have written a small routine to combat it. If you could let Mr. Progit have my address via your esteemed pages, I would gladly help him deal with this annoying problem.

Llist has another bug which prevents the listing of a long line of BASIC and there is yet another problem/bug in the 'Input #' routine which prevents its proper usage on the serial connections (RS232).
Neil Morgan, 85 Crescent Road, Bolton, Lancashire BL3 2JP.



• *The Spectrum Plus 3: printer problems*

TIP A program that's full of character

Here is a little PC program I have written in GW BASIC.

I am only just learning to use this BASIC but was quite pleased to discover the range of useful graphics characters that are available through GW BASIC.

I thought other PC BASIC users might find this short program useful and fun to type in and run.
John Gray, Eastbourne, Sussex.

```
20 KEY OFF:CLS
30 W$="PATTERNS - PRESS ANY KEY"
40 TB=(80-LEN(W$))/2
50 PRINT TAB(TB)W$
60 K$=INPUT$(1)
70 CLS
80 FOR Z%=195 TO 255
90 A$=STRING$(10,Z%)
100 FOR I%=5 TO 0 STEP -1
110 PRINT A$;SPC(5)A$;TAB(30)A$;SPC(5)A$
120 NEXT
130 LOCATE 10,5:PRINT "PATTERN NUMBER ";Z%
140 K$=INPUT$(1)
150 WHILE INKEY$<>"":WEND:CLS
160 NEXT
170 CLS:PRINT "PROGRAM END"
```

• *John Gray's program*

HELP! Memory test

I am studying on an A-level computer science course and have reached a point where I simply do not understand what is happening.

We are currently learning about RAM, ROM, PROM and EPROM technology but I'm being left behind as I simply do not understand the differences between the various chips. Please help.
Martin Froston, Park Hill, Essex.

RAM (Random Access Memory) is the scratchpad memory of a computer. You can load data or programs into the RAM chips and that information will stay there as long as power is supplied to the chip. The information is held in the form of transistors being switched on or off, the former state representing the value 1 and the latter zero. If power is removed, the transistors stop doing their stuff and the information is lost. RAM is used as a temporary store for programs that you've loaded and data necessary to the running of those programs.

ROM or Read Only Memory is a completely different device, consisting of a matrix of diodes in which selected diodes are destroyed by applying a current across them in the 'wrong' direction. Particular diodes in the matrix having been blown are used to represent the value 1 and the working diodes the value zero. Information burned into a ROM is stored permanently, hence you can switch off a computer, turn it back on and the operating system will still be there in ROM.

Programmable Read Only Memories (PROMs) are similar to ROMs but can be programmed by users using a PROM writing device which burns out the diodes contained within the PROM. Once programmed, information is permanent.

EPROMs (Erasable Programmable Read Only Memories) can be programmed by users and store information semi-permanently until the user decides to clear the chip. To do that, the EPROM is exposed to ultra-violet light and the electric charges representing information on the EPROM's surface are dissipated. The EPROM is then ready to be programmed again.

TIP Clicking drive

You published a letter in a recent Tech Tips column from the person experiencing strange clicks from his Commodore Amiga's disk drive.

The Commodore Amiga disk drives should make a ticking sound every third of a second or so if no disk is present. The Amiga does it since it needs to check if there has been a disk inserted or not.

You can buy special drives that do not click, but of course the simplest solution is just to insert a disk. If a disk is present in the drive, then the Amiga does not need to check for any inserted disks and the clicking will stop.
Anders Bjerin, Richmond, Surrey.

There's no catch. We're giving you the Atari 520 STFM and £500 worth of great software titles for just £399.99.

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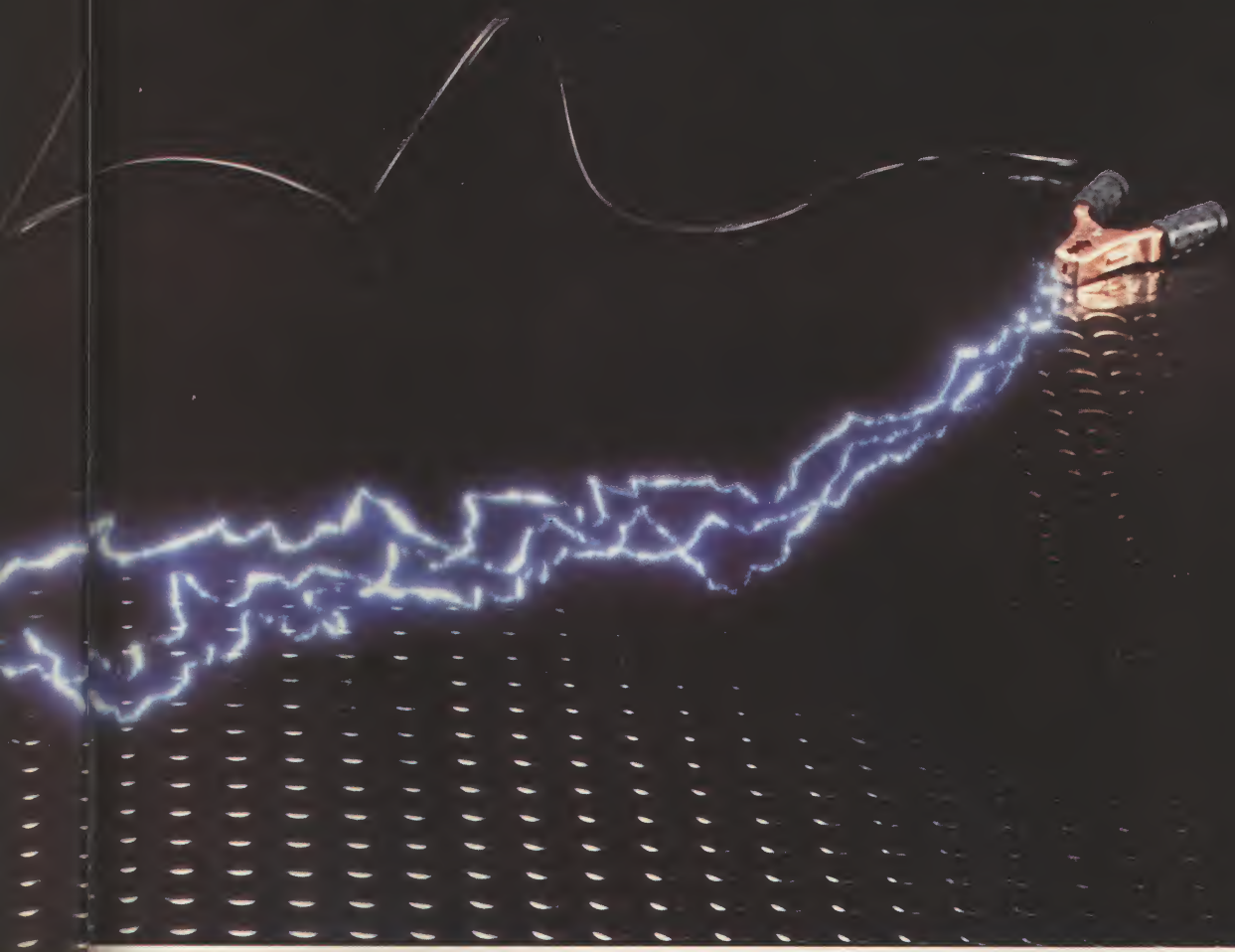

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EXPRESS LISTINGS

Bumper Christmas edition! Listings that you don't have to type in...

TEN USELESS PRESENTS to be bought for Christmas

10 Mouse holder – Why buy a mouse holder when your hand does the job pretty well for nothing?
20 Mouse mat – For £5. Or use a copy of *Express* which only costs 58p and is more interesting to read
30 Furry mouse cover in the shape of a mouse – From Terra. And how about some imitation mouse droppings too?
40 Mouse cleaning kit – For £15.95. Or how about a can of non-CFC furniture polish and a cloth for under a quid to keep your desktop clean instead?
50 Disk condoms – Offered at Comdex, but as usual the Brits thought of the joke first: one PD supplier, Paradise Computers, gives one away free with each purchase
60 Stick-on head, arms, tail and legs to make your monitor look like an animal – Like 30, only bigger
70 Miniature torch for looking into disk drives – From the doctor who invented a cure for which there was no known disease
80 'InvisiCalc' – A totally blank disk that once circulated in the US: a novel way to get round piracy and viruses
90 Wooden disk box – £45 buys you the perfect complement to your wood-encased computer (an American firm will do that conversion for you), your Morris 1000 Countryman, and your wooden leg
100 Air ioniser – £30 unit which simulates a negative ion-rich mountain breeze. Alternatively just open the window

TEN MORE PRESENTS this page would buy for famous people this Christmas

10 Neil Kinnock – Disk-based thesaurus to help him write, compose and put together his speeches, declamations and oratory
20 David Coleman – A Psion MC400, whose facility to record and play back speech at any speed might help him produce an audible sentence
30 The Birmingham Six – Half a dozen copies of *Breakout*
40 Anyone playing Steve Davis at snooker – A Z88 portable with its rubber keyboard so they can keep busy writing their biographies in silence while he compiles another century break
50 Mikhail Gorbachev – An on-line version of *PC Globe*, the world atlas program, so he can keep up with which USSR republics have gone independent in 1990
60 Anyone who's bought shares in gas, water etc. – A piece of kit they already own, then charge them for it
70 Blue Peter – A PC200, to see if they can make a computer out of it
80 Kate Adie – For her foreign correspondent reports: a Husky portable, the one that can withstand bullets, bombs and grenade blasts
90 Atari's PR team – After their ad that claimed a Portfolio would 'make you a better lover' because you won't 'forget her birthday' – in the *Guardian* through an extraordinarily-inspired piece of media planning – how about a subscription to OASIS, the organisation against against sexism in software (and presumably hardware ads too)?
100 Anyone waiting for an operation on the NHS – Software Toolworks' surgeon sim, *Life or Death* – the nearest thing to a hospital they'll end up seeing

TEN POP GROUPS who've been mentioned in computer magazines

10 Fleetwood Mac – A number of plugs, mainly due to Mick Fleetwood's involvement with the computerised Hotz Box to the point of prompting an article titled 'Fleetwood ST' in *ST Amiga Format*.
20 The Undertones – Fergal Sharkey was said to own a C64, a Mac and a Tandy 100 in one weekly
30 Ultravox – Warren Cann was interviewed at length in *ST World*
40 Yazz – Atari are getting involved with her, so to speak
50 Julia Fordham – Atari seems to be confident that people like her are the type of people most likely to buy an ST. Perhaps they are thinking of enlisting the help of Ralph McTell too?
60 Blondie – Debbie Harry was present at the Amiga's launch
70 Frankie Goes To Hollywood – This group actually had a game named after, and based on, them in 1985: the Speccy version was good, the C64 one even better
80 Mainframe – Of late 1984 obscurity, it consisted of Murray Munro and John Molloy (not the chap who did the music to *Corruption* on the Amiga, by any chance?)
90 Erasure – Mentioned again and again and again... apparently regarded by the computer press as the only 'synth' band
100 Stranglers – News abounded of a Spectrum adventure to be written about them using the Quill called *Aural Quest*. Meant to be a tie-in with their album Aural Sculpture around late 1984

• Ahmad Alam of Manchester gets some free software for his Amiga for supplying this list

TEN PASSWORDS commonly used that people think 'no-one will ever guess'

10 HELP – ...anyone who wants to break into the system
20 TEST – Though as a test of security this one fails miserably
30 HELLO – A nice user-friendly password – and hacker-friendly too
40 SYSTEM – Any systematic snooper will get this one in seconds
50 PASSWORD – So obvious it's brilliant, isn't it? No, not really
60 SEX – And some of its synonyms, linked words and related concepts that don't appear in *Roget's Thesaurus*
70 WELCOME – And why not send the hacker a glass of sherry and mince pie too
80 PHONE – Aha, trying to dazzle us with technical terms!
90 QWERTY – If only they'd allow this in Scrabble
100 FRED – Look at the keyboard: for the one-finger typist, it's an easy word to enter. And so is the system for the hacker.

TEN 1990 HOROSCOPES based on the machine you own, not your star sign

10 PC – Curb your natural spending instincts in 1990: try to stick within limits, like low-cost sub-£2,000 databases and budget word processors for under £500.
20 PCW – As a man of the cloth you already know about eternal matters, such as waiting for *LocoScript 1* to scroll to the end of a document. Upgrade to version 2. You have tough decisions to make over the ordination of women, as PCWs have the highest proportion of women owners.
30 Atari Portfolio Pocket PC – Visit your optician regularly: if caught early, your squint may be cured. You're quite vain, but don't be tempted by cosmetic surgery – such as a transplant of smaller fingers
40 Atari ST – You're courageous, determined and inventive, and never give up even if things look hopeless – as shown by your attempts to convince people that your machine is better than the Amiga. You're heavily into MIDI and synthesisers, so why not try something different, and get into music instead?
50 Commodore Amiga – Don't worry about your complexion: it's only a phase, and isn't caused by the stress of worrying when the Amiga will crash next. Keep a check on your natural generosity, as you could end up giving too much away to your friends – especially if they give the police your cracked version of *Batman*
60 Archimedes – Money is no object to a visionary like yourself, but keep a sense of perspective, and the vital issues: it's difficult to do anything else, because all you can get for the Archie is graphics and DTP software.
70 Apple Macintosh – Your devil-may-care spirit of adventure and pioneering, already shown by the fact that you bought a machine that the ST can now emulate for a quarter the price, is in for some testing times this year as you try to set yourself up as a one-person desktop publishing consultancy: everyone else with a Mac is doing exactly the same.
80 Consoles – Your preoccupation with leisure needs watching. Try to spread your wings (no, I don't mean buy a flight sim).
90 Any 8-bit machine – You're naturally loyal and trusting – to late 70s technology, for example – but your steadfast nature will be repaid in the 90s as 16-bit games stay expensive while 8-bit games stay cheap.
100 Portable PCs – You enjoy travelling, which is just as well, as you have to keep moving around from place to place to make your screen legible. You will make a lot of new friends in 1990 – mainly salesmen trying to sell you more kit

TEN FACTS about Alan Sugar

10 His first job was boiling beetroot for a local greengrocer
20 He formed Amstrad in 1969 at the age of 21
30 One of his first products was a record player cover which cost 50p to produce and sold for £15
40 He is so impatient to get to his penthouse at the top of Amstrad towers each morning he doesn't say 'Good morning', or anything else, to anyone
50 His two favourite expressions are 'frankly' and 'that is a load of crap'
60 He is a model family man, and Anne wed him before the days when she could be accused of marrying him for his money
70 He never works overtime – all his business is done strictly 9 to 5
80 Once he repeated the question 'What's that?' several times when pointing to a Z80 chip, only to be exasperated by replies like 'it's a Z80' and 'it's a processor, which means basically...'. Eventually someone came up with the right answer. 'About £3.50, Mr Sugar'.
90 At one time Amstrad was the main supplier of teapots from the Far East to British chain stores
100 He is an honorary Doctor of Science, an award bestowed on him by the City University in December 1988.

TEN COMPUTERS with personal names

10 Joyce – The Amstrad PCW's nickname is said to have come from Joyce Caley, Amstrad chairman Alan Sugar's secretary
20 Arnold – Amstrad CPC's code name, reputedly because it is an anagram of Roland Perry, one of the developers
30 Archie – Corruption of 'Archimedes', a slightly old fashioned name for a very futuristic machine
40 Mac – Contraction of 'Macintosh', Apple's good buddy
50 Stacy – Atari ST laptop trying hard to earn its New Age name
60 Lisa – Forerunner of Macintosh
70 Amy – Nickname of Commodore's decidedly feminine Amiga, whose full name means 'girlfriend' in Spanish
80 Adam – Coleco's early machine, now as dead as the first man himself
90 Vic – Commodore's machine that brought to mind having your chest rubbed
100 Dell – Heavyweight PC that Del Boy definitely wouldn't have on his market stall

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1989 saw one million computers being installed each month, and £1 billion-worth of software being bought each day around the world. In Europe alone, personal computer purchases went up by 52 per cent in one year. Such is the scale and pace today of the revolution in information technology that began this decade. And if '89 is anything to go by, computing in the next decade will have an even greater impact. For one of the main launches of the year, Intel's new 80486 chip, boasts computing power 50 times that of the original PCs at the beginning of the Eighties.

■

It has been a year dominated by hacking and virus scares, greater compatibility between computers, more portability and a significant blurring of different media. Computers now offer pocket-sized desktop power at cheaper and cheaper prices with applications ranging from neural programming to video editing. The scope is massive.

■

So with so much going on it's good to take stock and separate the magnificent from the mediocre, the ingenious from the inferior, the laudable from the laughable and cast our optical scanners over the year in print

THE FALLING PRICE OF PC POWER

Over the year, the cost of useful power on a PC plummeted. The 286 PC firmly established itself as the leading platform for personal computer owners with some 34 per cent of the market. With escalating demand combining with escalating supply, increasing competition took over and Amstrad began to lose its lead. The company was in the unfamiliar position of having stocks of computers worth £200 million sitting in its warehouses – twice the amount Amstrad sold this year.

Almost month by month the price of a 286 with 20Mb hard disk dropped and dropped:

January	Vision Technology	£995
April	Viglen	£896
May	Philips	£780
August	CAS	£600

As we hit 1990, the new battlefield will be the 386 market. In 1989 the price fell from way over £2,000 to as little as £999 with 20Mb hard disk and monitor.

1989: THAT WAS

IT'S A MONSTER • Intel's brand-new 486 chip was unveiled in Chicago in April leaving industry pundits buzzing with expectancy over a semiconductor with nearly four times the power of a 386. Running at 20 MIPS, the chip's arrival led some sources to forecast that 386 prices will come down so quickly that the 286 PC will be rendered obsolete within two years. British company Apricot was the first to put the 486 to use, launching its 25MHz, 16Mb VXFT Server only two months later.

THE RISING HEIGHTS OF PC POWER • Compaq unveiled what it claimed to be the most powerful PC in the world – its Deskpro 386 running at 33MHz. Some 30 per cent faster than other 386 machines, the Deskpro could also claim to be the world's most expandable machine. Up to 1.3 gigabytes of storage space could be fitted internally – while all in all it could externally address 2.6 gigabytes. Although costing $10,000, the price–power ratio represented an almost incredible bargain. All of a sudden 33MHz became the standard millions of Far East cloners sought to emulate.

POCKET ENCYCLOPAEDIA • Attica Cybernetics of Oxford brought out its Dynabook – a pocket-sized CD-ROM PC for £3,800

ASSORTED FAX • The PC Fax card made its debut – now users could receive all that junk mail direct to their screens.

FLOPPIES FLIP • Fujitsu announced a sub-£200 floppy disk drive that can handle monstrous 22Mb disks with an access time of only 65 milliseconds – that's faster than some hard disks. Closer to home, Micro Solutions brought out a 3.5-inch drive that could access 2.8Mb by doubling the recording frequency.

WAFERWARD? • Sir Clive Sinclair kicked off '89 in fine form, announcing the launch of the world's first wafer-scale integration memory device. Claimed to increase the speed of memory access a thousand fold, WFI may or may not have transformed computing – or even memory technology – it's difficult to remember hearing anything else about it since its announcement.

HACKING: THE YEAR THAT NOTHING WAS DONE

By far the most popular computer-related stories to appear in the national press regarded that shady breed called the hackers. There were strange feats of electro-genius, warnings of 'new breeds' of hackers, and the long running 'should they be jailed or shouldn't they' saga. *Express* ran a total of 15 stories concerning hacking.

In 1989 the hacker, for the first time, became more than an oddity of the modern age – he became a pest to be dealt with. As the year began it seemed certain that the decade would end with hacking being made an illegal act, but we hadn't taken the gently meandering flow of the British legislative procedure into account.

Emma Nicholson failed to push a private members bill through the Commons in the summer. A few weeks later the Law Commission published a report suggesting that hacking should be made illegal with prison sentences for serious offenders.

Some said the commission was being too tough, but most agreed with the gist of the report. But come last autumn's Queen's Speech the Department of

Trade and Industry had decided to leave any legislation out.

Businessmen aren't having much luck with the Government. Some even turned to employing hackers who could test out company computer systems.

BAD 'UNS

In the US hacking is illegal. One Kevin Mitnick was charged by police with computer fraud – he managed to alter a judge's credit record, tamper with his own police files and cause £2 million of damage to Digital Equipment's computer system. He was considered so dangerous to the community that when arrested he was not even allowed access to a telephone.

By contrast, in the UK a hacker who had broken the law by causing criminal damage to university files was let out on bail on the understanding that he would not use his computer.

And in Chicago a woman called Lynn Doucett was accused of setting up a network of 60 teenagers throughout the US who were employed to hack into computers and obtain credit numbers. The Fagin-style operator picked up young hackers by logging on to bulletin board networks.

In America it was crime, on the continent the hacking community was gripped by East/West spying. It seems that those German spy rings which were caught were doing it out of 'technical curiosity'. At least that was 21-year-old Hans Hubner's explanation for giving the Soviets Western information

Worse of all was tragic 24-year-old Karl Koch who doused himself in petrol and set himself alight after being caught hacking.

VIRUSES: THE DISEASE CONTINUES

On January 13th (a Friday) some gullible sorts were expecting a horrid virus to spring up out of the floppy and cause havoc to their computer systems.

Apart from a few minor hitches (mostly in computer systems which suffer foul ups every day) the Friday 13th virus was a non-starter. The death of thousands of computer systems had been greatly exaggerated.

It was no surprise then that people's computer systems were still intact on Saturday 14th October – despite warnings not only from tabloids but also national television.

The vast majority of 1989's viruses were curious little things. Take the foul mouthed virus which replaced real words for swear words, or the one which replaces letters with random ones at a certain typing speed (aimed at fast typists).

NASA suffered at the hands of political virus planters, but the anti-nuke program only got as far as administrative computers. More worrying was the one which fouled up Japan's main seismology unit just after the San Francisco earthquake. The poll tax virus which replaced the names of people with dead people's and children's names was never proved to have existed.

Still, the vicious Data Crime virus is lurking somewhere, and if you get that your hard disk will know all about it. As we move into the nineties it seems the plague will run on and on. The latest incarnation being the Aids virus – a Trojan horse hard disk formatter.

NAME DROPPING

Atari was forced to make a quick name change last year. Their pocket PC was called the Folio but that clashed with the moniker of an American personal organiser. Atari called its little machine the Portfolio and, surprise surprise, declared that it was a better name anyway.

AS THE YEAR THAT WAS

WHERE ARE THEY NOW ? • *(if they were ever anywhere anyway)* • Amiga portable • Sinclair's PC-compatible • Konix games console • ST console • Amstrad's PC-compatible PCW

NAME DROPPING II • Hewson hastily changed the name of its release *Kalashnikov* to *Custodians* because it feared the word was too closely associated with psychopathic mass-murderer Michael Ryan (of Hungerford infamy), who shot more than a dozen people with a Kalashnikov gun.

NOTHING TO TOUCH IT • Games giant Nintendo launched U-force to unsuspecting masses at the winter CES show. Designed to replace the joystick, the box-shaped device is operated by merely sticking your hands inside and moving them in the required direction without needing to touch the sides. To fire you only need shake your hands violently for a split second.

2P OR NOT 2P • Following hot on the heels of IBM's 'I think therefore IBM' and Atari's 'I think therefore IBM won't get my PC order', the Brentwood Boys stunned punters with their 'I think more carefully therefore I Amstrad'. An immortal line worth every penny of the reported £7 million campaign surrounding it to publicize the PC 2000. A week later, stunned punters were also informed that numerous reports of hard disk faults on the 2000 could be easily rectified by a capacitor costing only 2p.

LE COMPUTER • French language purists were showing their disapproval of ugly English words . The Acadamie Francais said 'software' is wrong and 'logociel' is right. Nobody has told the French population.

HOGGING THE PUBLICITY • Games publisher US Gold got itself into trouble over a sexist advertising campaign. An ad for *Psycho Pigs UXB* depicted two young men gloating at a poster of a scantily-clad young woman who was holding a copy of the game. Suffice to say that one of the lads was saying: "I know which one I'd rather play with." A US Gold insider later revealed that the over-the-top ad was produced on purpose because the firm knew *Pigs* was not a particularly good game and hence needed a lot of publicity. Shame.

VIOLENCE IS GOLDEN • American moralists produced an in-depth report 'proving' that computer games have adverse effects on young people. 'They're far too violent' complained an impressive line-up of child psychiatrists. Not enormously surprisingly Mary Whitehouse agreed, as did notoriously-opinionated Tory MP Geoffrey Dickens. Meanwhile the chart-breaking, best-selling computer game of '89 involves a robotic policeman blowing away hundreds of criminals.

WHAT A SCORCHER... ALMOST • Early January saw the million or so Amiga owners worldwide wowing to the screenshots from *Dragon's Lair*, the six-disk 130Mb arcade adventure. Although egos took something of a battering when it made it to the ST six months later, sales on both machines probably stayed in three figures. Like *Sword Of Sodan* and *Who Framed Roger Rabbit?*, *Dragon's Lair* scorched through the screenshots but slumped in the shops. Great graphics, but sadly no gameplay.

KOP THIS • Football-loving gamers were treated to a farce in January. Two companies said they had the rights to a Liverpool game, another had the rights to a Kenny Dalglish game and one of the above had Liverpool striker Peter Beardsley. Simple enough; except that one Liverpool was the team licence and the other was a licence for the entire club. Nobody has heard from the club licensee, Video Images, since then.

CAGEY REMARKS • Mirrorsoft saw red when *Express* suggested that no version of *Dungeon Master* would appear on the Amiga 500. "We're in daily contact with FT [originator of the game] and we know that there's an Amiga 500 version that's almost there in terms of quality," said Mirrorsoft's boss Peter Bilotta. "They've found it a terrific challenge." In fact it was too much of a challenge. The project was scrapped.

COMMS TO FRANCE • Comms fans were, for the first time, able to tap into France's Minitel service for a fraction of the original cost. ➤

TEN TOP SHOTS FROM THE LIP

■ **"Of course it's worth the trouble. Look at all the publicity I've had. Now people know I'm here. They've been ringing me up and saying 'good luck with your fight against Dixon's'."** – Newcastle computer dealer Brian Dixon after refusing to change the name of his shop – Dixon's Computer Centre – despite of pressure from the High Street giant.

■ **"Quite frankly the ads were a bit of a disaster and it's pretty safe to say we won't be doing them again"**– Elite's Brian Wilcox on the short-lived penchant for advertising games on the unconventional medium of commercial radio

■ **"We haven't done much clever stuff. It's just such an obvious thing to do"** – MGT's Alan Miles on why his firm brought out the multi-format Lifetime disk drive

■ **"I'LL TEAR THEM LIMB FROM LIMB"** – Noel Bradford, of the London embassy bulletin board after finding that hackers had wiped his hard disk of its 2,000 shareware and PD programs.

■ **"I would not like to explain to relatives of a victim killed by someone hacking into an air or rail system that the police have no power to interfere until after someone is killed"** – A police computer crime specialist to *The Observer* newspaper on the escalating dangers of computer hacking.

■ **"Ten years is far to good for these parasites on humanity. Now I'm not the sort of person that advocates dousing people in petrol and torching them, but I think they should be strung up before someone gets killed"** – Ken Mosley on Tory MP Emma Nicholson's plans to make hacking a criminal offence.

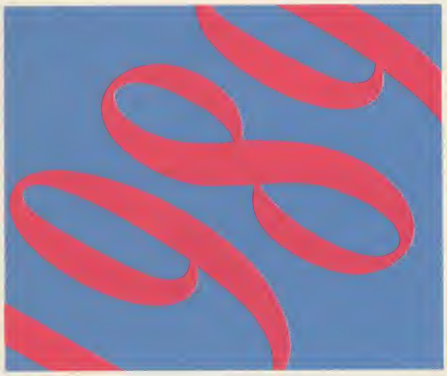
■ **"Ken Mosley's piece in issue 27 has to be the most warped piece of journalism it has ever been my misfortune to read"** – David Berry, one of the many readers doubtless delighted when it was revealed Mr Mosley had later emigrated to Iran to follow 'military-religious studies'.

■ **"Disk 15 certainly is 'amazing' – we were thoroughly overwhelmed with wonder as to how anybody could release such trash. Even at £1.33 a game, Disk 15 represents a complete waste of money."** – Rik 'Hitman' Haynes on the only game of the year to dispense with the old *Express* star system of reviewing – it received a gravestone!

■ **"Apricot signs Specialix to supply the SI series of high performance I/O Controllers for new VXFT Server Series of Unix hosts and complete range of Xenix Systems"** – *Express*'s favourite press release headline culled from the estimated 6,000 we received in 1989.

■ **"To kill Nintendo"** – Atari boss Sam Tramiel stating quite succinctly the company's plan for the next five years

■ **"Er, no, I can't comment on that one or off the record and don't quote me on that"** – an Atari spokesman putting the record straight on the battle with Nintendo and our news editor's favourite response to a question he may or may not have asked.



PORTABLES

1989 saw a massive number of portables launched on a market clamouring for miniaturised machines with no loss of features.

Prominent among arrivals were the Atari Portfolio and the Poqet PC, which brought together PC compatibility with pocket portability. Running on AA batteries, the tiny powerhouses set out to fill the gap between the home and office – files could be transferred between both bases with ease after working 'on the road'.

Psion's new range of portable laptops totally transformed its Organiser range to provide a clam-shell design with impressive innovative features such as voice dictation.

Around the world just about every PC manufacturer launched a portable. Not only was the race on for the ultimate lightweight VGA machine with 40Mb hard-disk, but colour started to creep into the stakes. Hitachi launched the world's first colour portable at the PC Show and immediately announced plans to bring out a colour EGA version next year. But like desktop machines, you pay your money and take your choice. It's just to early to say whether the market will plump for the low-cost, inside-pocket Portfolio or the top-notch Compaq luggable laptops.

TAILS THEY LOSE • Eclipse announced the £75 leadless mouse from Hong Kong – relying on infra-red data transmission – while to celebrate its anniversary, Logitech released its range of naked mice – naughtily transparent.

OF ALMOST COSMIC PROPORTIONS • *HyperCard*-based *Cosmic Osmo* for the Mac took the award for the world's biggest game weighing in at a hefty 6Mb. Its brilliant cartoon animations and whacky storyline easily made it the most innovative release of the year. Our August double-page walk-through feature on *Osmo* took another record too – the layout file totalled 1.5Mb in size!

GALLUP AHEAD • MicroProse's original driving game *Stunt Car Racer* surprised everyone by taking Gallup's number one slot ahead of all the big name licences.

CLIVE ALIVE • *Sun* readers spent the year enthralled by the relationship between the ever so clever Sir Clive Sinclair and one Bernadette Tynan. In February *The Sun* said: "Her heart throb may not be every woman's ideal fella, but computer whizzkid Sir 'Brainbox' Clive Sinclair, 44, is Bernadette's dream man." Tynan and Sinclair later split.

CHRISTMAS SHOPPER • The first *Computer Shopper* Show was a massive success with 30,000 buyers turning up at Alexandra Palace for a spending frenzy. More floorspace is planned for next winter's event which will take place at the Wembley conference centre.

BITTEREST PILL • "This is a disaster year for us. We made some bad mistakes. I don't really know why so many things went wrong at the one time." Alan Sugar in February when profits and shares dipped badly. He was worth £400 million then. Now he's worth £100 million.

KIDS TODAY? HUH! • The Corporate Computer Security Conference called for children to be taught 'computer ethics' in school. They fear today's youngsters could turn into computer criminals unless they 'develop the right attitudes'.

CONSOLE YOURSELF I • So angry was Psygnosis with rampant piracy that the firm said it would pull out of writing games for the ST and Amiga and stick to consoles.

CONSOLE YOURSELF II • Exclusive details of an Amstrad console based on the CPC were revealed by *Express*. When contacted, Amstrad boss Alan Sugar hung up the telephone. Three months later the firm still refuses to comment.

CONSOLE YOURSELF III • It was the year of the PC Engine. Micro Media had the machine working on British tellies first. Now the country is awash with mail order firms

touting the things, journos chasing the least detail about the alleged 'PC Engine 2' and brain-dead kids who have spent too much time in front of Engine shoot-'em-up *Gunhed* (above).

CONSOLE YOURSELF IV • Software publishers were in uproar after the launch of Konix's Multisystem games console. Allegedly restrictive terms on who could publish what and when prompted boycotts from Domark and Elite in February. The firms said the conditions infringed their independence as games publishers.

THE ARCHIE SPEEDS AWAY • The announcement of the Aleph One Card for the Archimedes 400 series pushed micro power to new heights by equipping the machine with a massive 10MIPS performance – five times that of a 25MHz 386 and 100 times faster than an Atari ST. For £600, Archie owners could upgrade their machine to the equivalent of a £10,000 workstation. The Archimedes no longer looked so expensive.

THE PRICE OF LEISURE • *Express*'s May survey on games revealed that a typical software house received only five per cent of the recommended retail price for a game. The biggest beneficiaries? – the dealers take 40 per cent, the taxman 15 per cent.

PC200: WHERE NEXT? • Amstrad admitted that the future of the PC200 is in doubt. UK boss Barry Young described the machine as "Not one of our most successful products". A decision is expected soon.

THE MORI THE MERRIER • A survey by MORI revealed that one in four British households has a home computer.

THE MORE THE MERRIER • Despite gloomy predictions computers are once again a favourite Christmas purchase. Families are buying them instead of other electrical goods such as television sets because they are perceived as being an investment.

BUNDLES OF JOY • In their attempts to get hold of your hard-earned cash the hardware manufacturers kept offering more and more for your money. The Superpack (ST) , Batman Pack (Amiga) and Class of the '90s (Amiga again) were inspired.

OUT TO GRASS • A London drug dealer was jailed for eight and a half years after customs officials found details of his unsavoury operation on his Apple Macintosh hard disk. He thought no-one could get past his 'unbreakable password'. It was the name of his favourite song, Blanket on the Ground.

THE WEIRD AND WONDERFUL

IT'S A KILLER • A Russian M2-11 supercomputer, programmed to play chess against grandmasters, was de-programmed and dismantled after reputedly murdering a human opponent after losing three games on the trot. Nikolai Gudkov died from electrocution in front of 500 people after touching the metal chess board. Or so the *Sunday Sport* reckoned...

REVEALED! • AT&T's famous Bell Laboratories, the outfit that invented the first transistor 41 years ago, announced plans for the next generation of supercomputers – they'll be invisible! Bell's boffins claimed the molecular breakthrough after prototyping a device that holds semiconductor clusters of thousands of atoms formed into minute crystal patterns.

K9 FOUND • Faced with having to dispose of 350,000 stray dogs a year, the

RSPCA turned to computers to help out. Drawing on the experience of tests on Irish guard dogs, RSPCA officials studied plans to inject all dogs with microscopic chips carrying a name tag code that could be read by scanner. Missing mutts could then be returned home when found.

FANTASTIC VOYAGES • Professor Iwao Fujimasa of Tokyo University designed a range of computerised surgical instruments so small they can be guided through your bloodstream to perform surgery on the spot. A hundred thousand of them would only measure the width of full stop. With funds from Hitachi, Fujimasa named the devices Microbots and forecast their widespread use in medicine by the end of the Nineties.

TALKING RUBBISH • Hoover's Sensotronic Audio System 3000 is stuffed with microprocessors which means that if maintenance is required it can talk to you! Quite remarkable – the 3000 is a vacuum cleaner.

ALIEN RAYS CRASHED MY MICRO • Toronto Stock Exchange went down for three hours in August leaving Canadian scientists to offer the explanation that it was all due to the damaging invasion of protons released by sun-spot activity. And no, it wasn't *The Sport* this time, but techies' bible mag *Byte*.

SMALLER AND SMALLER

Atari's portable colour entertainment system was launched in Chicago in June. Now known as the Lynx (below), the little beauty boasted 4,096 colours on a screen measuring only 3.5 inches diagonally. Originally developed by Amiga engineers working for one-time games giant Epyx, the Lynx ran at 16MHz and cost $150. Not to be beaten to the punch, Nintendo brought out its own equivalent – the Gameboy. Although the screen is even smaller, a mere 2.5 inches, it only displayed mono images. But at only $89 it became the ideal games hand-held – the perfect medium for playing the simplest and most addictive game of the year – *Tetris*. Both machines have yet to make the UK.

BARGAIN OF THE YEAR • By attending a John Russell auction in London a lucky *Express* reviewer managed to pick up a complete Amstrad 8256 PCW system – normal price £399 – for an astonishing £25.

HEADING UP THE HEADLINES • "NEC PC DTP CD-ROM" – issue 18's rather understated announcement of NEC's £800 CDR75 CD-ROM player.

BITS AND BITES • The Beatles' firm Apple Corps entered into a legal row with Apple the computer company over alleged misuse of the half-eaten apple logo.

IGNORANCE IS DISMAL • A mutated game caused universal disgust. Some idiots has changed the sprites on Mastertronic's *Sidewinder* into stereotypical and racist images of Asians, called the game *Paki Bash*, and distributed it around Scotland's playgrounds. Sadly, police investigations came to nothing.

AS-EASY-AS • After months of waiting, two delays and a fair smattering of hype Lotus *1-2-3* Release 3 finally made it into the UK. It was hailed as a triumph when launched.

LITTLE DISK FROM THE PRAIRIE • The quest for portability went on and on. Prairie Tek of Colorado managed to bring out a 20Mb hard drive with motor and read/write heads measuring a mere two and a half inches in diameter.

1989'S NEWEST COMPUTER GAME CHARACTERS • Bob Monkhouse • Sooty • William Shakespeare • Jaws • Jocky Wilson • Gilbert the Alien • Michael Jackson • Dan Dare • Elvira • Duckula

BEEB BOOB • The BBC launched a television program that was 'relevant' to home computer users. Viewers yawned their way through The Software Show.

JUST ADD MILK • Nintendo mania continued in the US. A range of breakfast cereals based on Nintendo games characters such as the *Super Mario Brothers* appeared on kitchen tables.

BRIT CHIP SOLD • Inmos, Britain's great hope for the chip market, was sold off to Franco/Italian combine SGS Thomson. Inmos said the sale by Thorn EMI would mean faster progress on its Transputer chip programme.

SUFFER THE CHILDREN • The Schools Inspectorate published a report slamming mainstream educational thinking on the use of computers. 'Information Technology from 5 to 16' said the use of computers as it stands has "little educational value", and recommended a thorough investigation. Three months later the Government lopped £5 million off expenditure for computer education.

OUT OF (SOUTH) AFRICA • US giant Hewlett Packard pulled out of South Africa because of 'no change' in the political situation.

BOMB RAIDED • One of house music's leading lights, Bomb the Bass, was commissioned by Mirrorsoft to write the music for some of its future games — including the remarkable *Xenon II*. Bomb the Bass – AKA Tim Simenon – uses Atari STs to sample and mix sounds.

HARD TO BT • MicroProse bought Telecomsoft from BT for an undisclosed fee. For the money the American firm laid its hands on the Rainbird, Firebird and Silverbird labels and spent the rest of the year launching a seemingly never-ending stream of Telecom games which, for one reason or another, had been delayed before the takeover.

ERASERHEAD BABIES • The long-awaited erasable optical disk appeared in Japan with both Hitachi and Sony shipping 5.25-inch models for £2,500. However, the first machine to arrive in the UK, Alphatronix' Inspire offering 650Mb of fast-access storage – the equivalent of 80 copies of the Bible – made you pay the price of 'fledgling technology' – a whopping £6,000!. Inspire was just a re-badged Sony drive.Tecnation's Bit Bopper system became the first to employ the new technology for non-business use.

FASTEST MACHINE ON EARTH

The £19 million NCube 2 Scalar (right) beat all records with the most unbelievable tech-spec it was ever our pleasure to report. Running at 60,000MIPS, the NCube ran 8,192 processors in parallel and had on-board storage of 500 million Megabytes. *Express* waxed lyrical on the machine's performance. Not only was it 15,000 times more powerful than an Archimedes, but you'd have to work for 1,200 years at McDonalds to afford to buy one. It would take an F-16, flying flat out, 17 days to pass the number of Amigas laid end to end the NCube represented in storage space.

Spoof reports of a Ncube emulator for the Spectrum were met with requests for contact numbers from some readers, while true stories such as the Ncube plotting a Mandelbrot set in 0.1 seconds, 9,000 times faster than an ST, were met with disbelief.

LOW COST ARC LIGHTS UP • After our exclusive in March, Acorn finally threw denials to the wind and launched its A3000 in May. Weighing in at £699, the machine (above) was Beeb badged and yet could deliver 4 MIPS, multitasking and 32-bit RISC power. Fully compatible with Archimedes 300 and 400 software, and optional BBC and MS-DOS emulation, the new machine certainly looked impressive. *Express* concluded it was still £100 over the mark though.

CHEAP, NEVER CHEAP • US Gold tried its hand at selling ST and Amiga games at the 'low' price of £9.99. The firm pulled the project a few months later. Virgin Mastertronic is now having a go, selling 16-bit budget games for a fiver, and Infogrames is selling games at a tenner.

HAND IN POCKET • A plea was sent out to gamers by Oxfam for unwanted games and computer peripherals. The response was great and Oxfam used the money to fund emergency relief work in Africa and Asia.

BUG OFF I • Atari's technical people were bugged by a bug in the Portfolio Pocket PC. A glitch in the operating system was causing some of the machines to crash. The only way to restart was by a hard reset which had the nasty effect of wiping all data on the machine. The problem has since been fixed.

BUG OFF II • Britain's most successful games fanzine *The Bug* was closed down after five years. The youthful Muswell Hill team dispersed to try to get on with living normal lives.

BUG OFF III • Bugs hit computer programs again, but the publishers were quick on the mark to iron them out. *Galdregon's Domain, Robocop, Federation of Free Traders, Falcon, Mini Office Professional Plus* and *Xenon II* were just a few which suffered on various formats.

PC VIRUS • As if anyone needed any further convincing that the PC had finally shaken off its two-tone monolithic MS-DOS meanderings, Firebird (RIP) released state-of-the-art, solid 3D shoot-'em-up *Virus*. Thus 16-bit power games crossed the Big Blue yonder and set the tone for the Nineties.

JAP BOPPERS • Sega began to record albums and compact discs of the latest nobby coin-op soundtracks for release to the inscrutable Japanese public

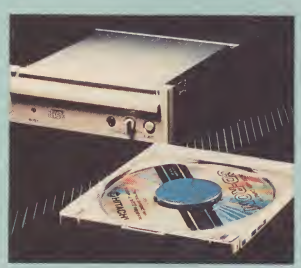
GET SMART • 1989 saw the number of smart cards – memory cards with on-board chips – rise to over 20 million worldwide. Once again 'fledgling technology' had its price though. A report released in June on the future of smart cards didn't find too many takers – it cost a mere £1,416.12!

RON TO YOU • Speaking at London's Guild Hall former US president Ronald Reagan said computers and information technology are the greatest weapons against 'Big Brother' societies. He said such societies would be "helpless against communications technology. All this has breathtaking consequences."

MULTIMEDIA: BUZZWORD OF THE YEAR

All year, more and more CD-ROM titles were being announced, from compilations of CodeMasters greatest simulations to massive interactive business databases. This new storage medium really took off in 1989 and in conjunction with the arrival of erasable optical disks signalled the end of the search for low-cost mass storage. The doors were open for new applications that could draw on all that storage space.

Macintosh, Archimedes, PC, and Amiga owners began to see applications being developed for their machines which would allow them to access CD-ROM players, CD audio players, videotape recorders and slide projectors. More importantly, the software allowed digital material to be combined from many such sources and manipulated to produce sequences which could be output to videotape.

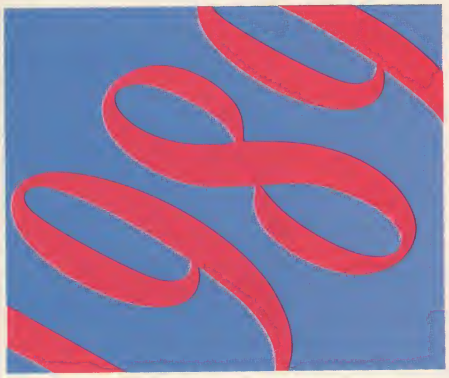


Desktop video and desktop presentation were the new buzzwords – extending and enhancing 'traditional' DTP. The Mac was at the centre of this latest revolution – principally because Apple regard multimedia as the main market of the Nineties and as such are moving in fast. The machine's *HyperCard*, emulated by *HyperPad* on the PC, *UltraCard* on the Amiga and an as yet unnamed variant on the ST, provided the controlling 'front-end' for a bewildering variety of CD-ROM based titles ranging from Mozart to NASA, from the *Guinness Disk of Records* to Picasso.

In Britain the BBC's Interactive TV unit announced plans for *Mediamaker* – an ambitious application aimed at providing a fully functioning professional television post-production suite – on the Mac in your home or office.

Meanwhile, using two Archimedes, a 650Mb erasable hard disc and a whole host of custom hardware, Tecnation launched the Bit Bopper – a state-of-the-art video sampling and effects system designed for the nation's dancefloors. As we leave 1989, Tecnation is set to launch both 16-bit and, incredibly, 8-bit versions of the system. The tone is set for desktop television in the Nineties.

REVIEW OF THE YEAR
1989



TAXING PROBLEM I • Local authorities were forking out between £10,000 and £20,000 for a software package designed to track down those people who hadn't paid the unpopular poll tax.

TAXING PROBLEM II • But some political hackers got their own back. A specially devised virus was placed in Scottish computer records which allegedly replaced names of potential payers with those of children and dead people. The authorities involved claimed they knew nothing of it.

TAXING PROBLEM III • A petition was presented to the Chancellor of the Exchequer by Micronet calling for a review of the 15 per cent tax on electronic services. Micronet said its board should be exempt for a tax largely aimed at professional services such as Reuters. 3,000 Micronetters agreed. The Government didn't.

HOPE SPRINGS ETERNAL • Strangest product of the year was a set of tiny springs which you could insert under the keys in your keyboard to give them a bouncy feel. The set costs £15.

OVER THE RAINBOW • German company Rainbow Arts introduced a way of loading games from your compact disc onto your C64. The *First CD Edition* cost £30 for ten games. For some reason CodeMasters grabbed all the publicity five months later with with a cheaper version.

WRATH ENDURED • Small publisher Impressions had to touch up some of the graphics on its game *Chariots of Wrath* after Mirrorsoft complained of similarities to *Xenon II*. The firm publicly called it an 'amicable' agreement. Privately it felt it had been bullied.

BAR NONE • Prisoners in Avon's Leyhill Prison were introduced to computing and were given lessons on a Bull mini computer in order to prepare for work outside the slammer.

IT'S A HARD LIFE • In a bold announcement Amstrad said it would be replacing those PC2286 and 2386 machines with hard disk problems. The 'dramatic gesture' earned Amstrad some terrible teasing in the national press, and a degree of admiration in the computer press.

MORE VILLAINS • A gang of French villains hijacked a lorry outside Paris and stole thousands of computer games. They were never caught.

!*&^% SKWEEK • W H Smith had to take copies of US Gold's *Skweek* off the shelves after it was found to contain foul language. One of the game's programmers had left a speech bubble containing swear words on the program.

COIN-OP CRAZY • Bosses of software houses were frantic with worry at the news that Nintendo insiders are looking at the possibility of not allowing coin-ops onto any other computer format if they appear on the Nintendo. The Nintendo games market is more profitable than the computer games market and, if Nintendo can steer clear of monopoly commissions, this would be feasible. Not surprisingly, Nintendo denies any such plans.

THE AIR WAS BLUE • IBM went bonkers when it found out that a company in New York was trading under the name Big Blue – IBM's nickname. Ironically, IBM has never copyrighted the tag.

VDU ALERT • The Geneva-based International Labour Organisation called for a worldwide survey into possible health hazards from computer screens. The group says VDU radiation affects the eyes, bones and muscles as well as contributing to stress.

SAM PLAYED IT AT LAST • The long-awaited Spectrum-compatible SAM Coupé (below) finally surfaced. With its built-in networking, MIDI, stereo sound and top-notch

graphics it looks to be a killer, until you remember that it has only got a 8-bit processor. The cynical press sneered – until they got hold of the machine and then they raved.

DON'T BANK ON IT • A computer error led to a large British bank losing £2 billion in the space of 30 minutes.The mistake reportedly cost the un-named bank its annual profits. A software error had caused money to flood into the accounts of hundreds of companies all over the Continent.

MORE PIRATES LAND • Pirated copies of Nintendo and PC Engine cartridges hit the UK in September for the first time. The gadgets (above) were selling at a quarter of the retail price of original cartridges and were being put together in the Far East.

PORN AGAIN • The bulletin board porn scandal raged for about three minutes before petering out. Even so, the then Home Secretary Douglas Hurd couldn't resist calling for porn spotters to report findings to the police.

THATCHER HAD MRS AN • Mrs Thatcher had an embarrassing encounter with a computer in Japan. The machine was supposed to translate Japanese into English and managed the following: "This company's having visit today of me is honourable."

THAT WAS THE WEEKLY THAT WAS • *GamesWeek* magazine stopped publication. It was wrapped in with sister paper *Popular Computing Weekly* before disappearing from the newsagents altogether.

BARGAIN BUCKET • Evesham Micros began offering buyers an Olivetti twin drive PC1 with monitor, delivery and maintenance for £299 including VAT, making it the best deal on the market.

JUST GOOD FRIENDS • Nintendo and Atari Games began the year sending each other lawsuits and ended it by calling each other liars and cheats. They still haven't resolved the scrap.

ORIGINAL SIN • Members of a religious sect branded computers 'the devil's tool' as they attempted to pull their children from computer related courses at school. The Christian Exclusive Brethren said that computers will give "the man of sin, energised by the full power of Satan, totalitarian control over the whole Western world." One of the reasons for their ire? If you give each letter of the alphabet a number – starting with 6 for A, 12 for B, 18 for C etc. – the word 'compute' adds up to 666! Scary!

REAL SPEED • IBM launched version II of its MCA bus standard. It runs at 800 megabits per second.

MAKING MORE ROM • Mirrorsoft announced that it would be investing £5 million in emerging CD-ROM technology. The first product was the *Guinness Disk of Records*. Mirrorsoft says it will concentrate on CD games.

ON THE LEVEL • Level 9 dumped its 'trolls and goblins' tag to concentrate on more modern day, risqué adventures.

VILLAINS STRIKE • Some £300,000 worth of stolen computer equipment was seized by the police – all of which had been taken from schools and warehouses. Police estimate that 40 per cent of second-hand computers on the market are stolen.

1/2P SUPERCOMPUTER • Japanese firm Fujitsu attempted to win a contract to install a supercomputer by charging the equivalent of half a penny. Rivals complained. The firm raised its prices.

CHIP IN • Intel's 486 was found to be flawed. Complex mathematical calculations were coming out incorrect and the company had to re-jig its ground-breaking chip.■

ATARI LAUNCHES

In true Atari style, the company launched numerous products this year and announced what seemed to be thousands more

Back in June, *Express* became the first magazine in the world to reveal the specs and price of the new range of Atari STEs – the mysterious 'Super STs'. For £399, the new 520 STE delivered 256 colours on screen from a palette of 4,096, and four-channel stereo sound. But programmers weren't convinced this was the 'Amiga-Beater'. *Express* caused a storm when we canvassed leading software developers – many of whom had signed non-disclosure clauses with Atari. Their combined verdict seemed to be 'too little, too late'.

However the arrival of the TT left

them standing – 68030 processor, 2Mb of memory hi-res monitor and 30Mb hard disc for under £2,000. Atari was now in the curious position of taking on both the Unix workstation market and hand-held console supremos Nintendo simultaneously. All that was missing now was the projected RISC-based ST to take the Archimedes on.

Atari reckons that the 68040-based RISC ST will be the firm's main computer within three years and that it will cost £1,000.

Nearly two years after rumours of a portable ST first began to surface, the Stacy was finally launched at the UK PC Show. The 2Mb RAM, 20Mb hard disk version was first out of the blocks offering full ST compatibility for £1,299. Interestingly, the machine on show was running the latest version of the year's hottest emulator – the £379 GST Spectre card allowing ST users to run Mac software. Purely by coincidence, Apple slashed the price of the low-end Mac range by 27% – while introducing its own portable – a snip at £4,500!

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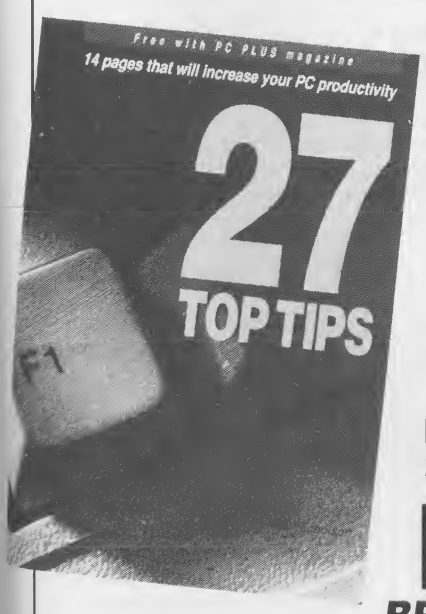

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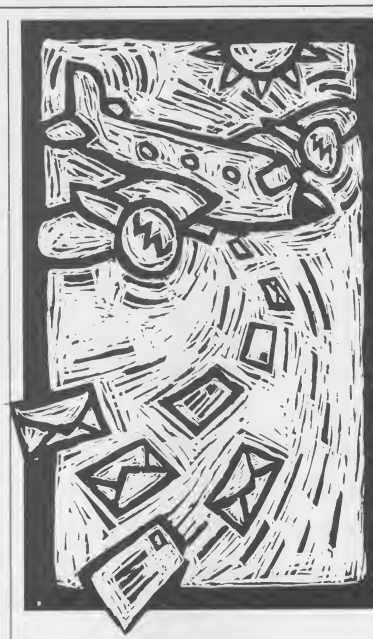


EXPRESS MAiL

Britain's liveliest computing forum – packed with comment, controversy and conflict. Write and tell us what you think! Reach us at: *Express Mail, 30 Monmouth St., Bath BA1 2AP* Sorry, no personal replies, we're too busy writing! This week's replies by Rob Ainsley

Graphic illustration

You said you would be interested in hearing further if anyone else had run into difficulties concerning the payment for work carried out on behalf of a computer company.

In January last year I entered into a contract with CRL, London, to produce graphics for a computer game called *Last Stuntman*. I completed the work after just three weeks and submitted same well before the due date. A programmer was then sent the graphics, and the saga begins at this point.

Around June, after many telephone calls to the programmer and CRL, I was requested to carry out some slight alterations, which again were completed very quickly, but not before a new contract was issued at my request – the original having become void due to the late date of the amendments.

Subsequently, the programmer was slow to return his work to CRL, which then said that his programming was not up to scratch and that the graphics were being converted for use on a different computer, not the Atari ST. Since then, I have made numerous phone calls and submitted an invoice for payment, the balance of which is well overdue.

CRL has never said that it is not using my graphics, and has mentioned a couple of times that I ought to be paid. But I have also heard that the graphics have had problems too numerous to mention, which I believe to be the province of CRL.

I have advised CRL that I shall begin proceedings to recover the money owed to me and that I shall write to as many computer magazines to try and inform the readers of the pitfalls associated with doing a good job for these companies.
Ian Barrass, Hull

We couldn't get through to CRL but would be pleased to receive the other side of the story.

Cheap PD

I see in Express Mail (issue 56) that you are considering including a section in *Express* dedicated to public domain software.

I recently joined an organisation called PCW World, of Cotswold House, Cradley Heath, Warley, West Midlands B64 7BNF 0384 66269. I ordered some software from them on Friday 24 November and received my order on the following Monday. I reckon that this is pretty good service.

No doubt your new section will feature the usual massive onslaught of goods available for the ST, Amiga and PC, but hopefully you will find a tiny space to include a well-deserved mention for this club.
Paul Kennedy, Herts

A tiny space! Ah, how about the place where the PC200 User Club holds all of its meetings?

Let's get Sirius

Firstly, regarding the 'who's best?' debate: has everyone forgotten the dear old Sirius, around 60,000-odd of which were sold in UK? Any machine with a 600x400 screen and the ability to give application programs up to 896K of memory circa-1983 can't have been all that bad! If only Chuck Peddle had been a bit more of a businessman ...

Secondly, about piracy. I totally agree that programmers have central heating bills to pay, and that piracy is morally wrong. But I once had a very animated discussion with a programmer who failed to see why, as a punter, I was unwilling to fork out £600 on a program that may or may not have suited my purposes. For that sort of money I want at least a week's trial, certainly not a brain-damaged demo disk.

I have learned to treat everything as shareware – if I like and use a program, I buy it. If I don't, the disk is reformatted. Under the circumstances I feel that this is a comfortable solution to the problem.

Lastly, your comments about astrology as being a harmless piece of fun are quite correct – for the newspaper kind at least. In my present writing occupation, I am in fact engaged on an astrology book, and can say (in accordance with Isaac Newton, who was also an astrologer): 'Sir, I have studied it, you have not!'.

Witness the following:

Any electrician knows that a wire carrying electric current has an associated electric field – the human body, being run on electrical signals also has one, however miniscule. Is this coincidence significant?

A lump of metal rotating in a magnetic field (such as the Earth, in those thrown off by the Sun) causes fluctuations in said fields, which is the principle behind generators.

Various types of magnetism from different types of planets will also have an effect. Indeed, radio technicians in America have discovered that transmissions are severely afflicted when certain planets are at 90 degrees to each other, which is what astrologers have been saying for many thousands of years (light waves meeting at certain angles will tend to cancel each other out).

The angles between planets in a personal horoscope act in a similar fashion to radio aerials and attract certain types of energies according to their disposition. If Mars is throwing out all of its energies and your horoscope (which is actually a map of your subconscious) hasn't the facility to tune into those energies, then you won't be affected, which is why newspaper astrology is just so much rubbish – it's too general, as you rightly suggest.
Phil Croucher, Surrey

Hmm. I'm not too happy about the idea of treating everything as shareware – it seems an invitation to piracy.

And as for Isaac Newton, if I were you I wouldn't liken myself too closely to a man who suffered severe depression and died a virgin. Trying to attribute astrological effects to electromagnetic fields is pointless; the fields we experience from TV transmitters, electric trains and computer screens will swamp anything from planets or stars.

You could more plausibly claim to be born under the sign of the Emley Moor transmitter, with your rising sign the 125 from Bath Spa to Paddington and a heavy influence of the Amstrad PCW. Personally I'm getting tired of this astrology debate. Anyway, how can astrologers have been saying that planets can effect radio transmissions for thousands of years? I didn't know they had Capital Radio in Tang Dynasty China.

Animated letter

I saw the Luxo Junior animation on a TV special that the BBC did about the Bristol festival in the summer, and I thought it was excellent. Not only are the people who produce these shorts proficient technically, but they are also obviously accomplished animation artists. To endow an Anglepoise lamp with a real and endearing character in only a few minutes of film is a very real and consummate artistic achievement.

Unfortunately, I wasn't able to video the program at the time, and it hasn't been repeated.

I've since seen one or two other

Different worlds revealed by a mouse

Question 24 of your quiz was quite interesting. The word 'naksha' is Urdu for map, and since Urdu and Hindi are spoken in virtually the same way (though it's worth noting that Urdu follows the Arabic script for writing while Hindi is entirely different), I doubt very much that the word would mean something different in Hindi, though I could be wrong.

As for options B and C of the question, I almost died laughing. Option B reads 'Malai Kofta'. Malai is the froth you get on the top of boiling milk, and a kofta is a meatball. The thought of the two combined in a dish brings on a slight feeling of revulsion. The other option, C, Keema Nan, however, is perfectly well within reason, since Keema is mince meat, and Nan is a type of circular bread.
Amad Alam, Manchester

• Naksha – the word means 'world' in Hindi

We were assured by the manufacturers of the Naksha mouse that it means 'world' in Hindi (the main language of India's several dozen). It seems to me quite reasonable that at the same time it could mean 'map' in Urdu (the language of Pakistan and similar to Hindi, but perhaps more influenced by Arabic).

Incidentally, did you see the article in the *Guardian* recently noting the advent of India as a world centre of software writing? This development is all thanks to heavy investment in new technology, coupled with an innate sub-continental patience and particular feel for mathematics (the Hindus invented negative numbers, and hence overdrafts as well).

shorts from the same stable – one of George Lucas' many film involvements – on TV and at the Museum of the Moving Image in London.

What I'd really like to find out is if any collections of these shorts are available on video. I thought perhaps the Bristol Festival might have produced a 'Best of' to illustrate the state of the art in computer generated animation today.
Steve Tetchner, Essex

No such collection exists as far as we know, but if anyone out there knows of one, or happens to have videoed the program you missed, perhaps he or she could get in contact with us?

Yawning heights

Physics, chemistry, magnetism, electricity etc. are just names given by scientists to forces that they do not quite understand. 'How' is not the same as 'what'.

You and your staff may be very up-to-date with computer technology, but your concept of Science is pure 19th-century Materialism, which was exploded for all time by the startling discoveries of modern atomic physics, which in turn describe sub-atomic particles that behave in ways logic, reason or common sense cannot explain.
N Foster, Merseyside

Sorry, I've told you I'm tired of the astrology debate. ('Your horoscope shows you are a very gullible sort of person and want to believe any rubbish people tell you'... 'Amazing, you're absolutely right')

Chemical weapons

In his rush to criticise my knowledge of chemistry, Paul Guinnessy (*Express* 57) has made a very dubious statement. I would like to know where Mr Guinnessy's '15 million tons of ozone' destroyed by the space shuttle comes from. If, as I suspect, it is one of those figures with which the environmental lobby so freely pepper their press releases, I think it can be disregarded. As Jerry Pournelle says, when he went to university, he had to learn calculus as preparation for studying ecology, but nowadays anyone calling himself an ecologist will proudly disclaim knowledge of any branch of mathematics.
Iolo Davidson, Glos

I can understand ecologists being rather disenchanted with conventional mathematics which gave them 15 per cent of the vote in the last European elections and 0 per cent of the representation.

Piracy strikes again

I have been reading your magazine for some time now (not the same one) and I am disappointed about your views on piracy.

You say that if people buy a computer they should buy software and not copy it; but a student who needs a computer for his course can't pay £700 for essential software. If this software was affordable to everyone, and not just an elite few, the benefits to the computerised society would be profound.

If you couldn't afford a pair of trousers would you be expected to go around naked? Or, if you couldn't afford to feed your children, would you let them starve? Darwin said that you have adapt to survive.
Reluctant Pirate, Bath

I don't believe for a second that you need to buy £700 of software for any student course. I think you're making this up to support the tired, old spoilt-child argument that says 'I want software so if I can't afford it I'll steal it.'

Darwin never said anything particular about trousers. Indeed the theory of phyletic gradualism makes no mention of hosiery of any kind, so there.

Dubious ad

I must draw your attention to the recent advertisements in your magazine for a book called *Dianetics* on behalf of 'Hubbard Dianetics Foundation'. This organisation is a branch of the now infamous 'Church of Scientology of California' (UK headquarters located in East Grinstead).

I fail to see any relevance to modern day computing of a cult that is reported to 'brainwash' its followers and split up families. Unless, of course, you believe the popular myth that the majority of computer users are impressionable and insecure youngsters.

It has been alleged that after publication of views against the cult, public objectors have received hate mail and offensive telephone calls from persons unknown. It is for this reason that I write anonymously.

I have no axe to grind. I do not belong to any rival or similar organisation, but merely write as a concerned and aware reader. Should you feel the need to seek confirmation or clarification on my views, I suggest that you contact *Private Eye*, which has in the past carried out extensive research.

I strongly urge you to reconsider continuing to run this advertisement.
Anon

I personally think the Church of Scientology is a load of old tosh, having been canvassed and questionnaired by them once upon a time. I told them so and walked out, and that was the end of it.

I also think astrology, nouvelle cuisine, Charlie Chaplin films and *Blind Date* are dreadful things utterly devoid of worth or basis too, but I shouldn't impose my prejudices on others by preventing them from advertising in *New Computer Express*.

The organisation has its detractors (though none of the allegations you mention has been proved) and we thought long and hard about whether or not to take the ad, but decided that it had just as much right to advertise as, say, a company that produces astrology software. However, we're looking into it.

Power plant

I was interested to read in the issue 57 article on antique computers that the early sixties Elliott 803 model was 'geranium transistor' powered. I never realised where the term 'flower power' came from. Was the Elliott asembled in San Francisco?
Gerald Jess, Norfolk

The Elliott was often used on building sites, and hence, at the places where it was ferried across roads, the sign 'heavy plant crossing'

Some facts of life about advertisements and magazines

■ I think your Shopping Express is very laudable – but I have a minor gripe about having to send in a voucher every time for the clubs/user group spot.

Would it be possible to arrange this so secretaries/bulletin board sysops could send in a voucher every month or two (to let you know it's carrying on). These tend to change a lot more slowly than small ads (for sale, wanted, events) generally. Perhaps you could build up a clubs/BBS page which could be put in every 2 or 4 issues.

Keep up the good job.
David Bolton, Blackpool

We do try to keep user club and bulletin board ads in for a couple of weeks, and we'll be happy to keep it up as a matter of course. Indeed, we may well begin to publish the lists every week, not just every two or four issues.

■ Keep getting better, more news, more letters, tips. The colour in the mag is an extra bonus, and no games section, ha, ha. Finally, trash Shopping Express:-

75 per cent of it is advertising while 7.5 per cent is useful (Top 50 guide) and 7.5 per cent is free ads.

5 per cent is job ads, and 5 per cent is for *Express* use (title page and so on).

In summary, only 12.5 per cent of Shopping Express is worth reading. Sorry about all the complaints, but views must needs be aired.
Paul Gregg, Northern Ireland

Come on! All magazines have to be a balance between ads and editorial, otherwise they wouldn't be economically viable. The new, fatter *Express* has more editorial pages than before (but a lower proportion because of the increased page count, which is probably distracting you) and the extra central ads section gives you loads of jobs and info.

And if you're looking to buy some more kit, you'll find the best buys in Shopping Express. Honestly, 80 pages for your 58p – and you're still not satisfied!

Some magazines I could mention give you 40 pages, with 12 words a page, and charge the same as the action-packed *Express*.

We'll be happy to trash Shopping Express as soon as ITV stops taking adverts and the BBC discontinues the licence fee!

■ I subscribe to your mag, and £35 is a lot of money for a paperboy!

Why does Shopping Express take up over half the magazine when it is all adverts? Even your repetitious recommendations are free ads, and they only cater to expensive hardware and for PCs, Amigas and STs software-wise. The rest of the mag has a liberal amount of ads as it is, (approx. 40 per cent!).

There are other 8-bits, with fewer magazines, so give a bit more consideration to the 8-bitters, please. Also, bring back the biographies, but do so for lesser known machines like the Dragon, Oric etc. I'd like to know about them!

Oh, while I'm at it, increase the number of news pages – again! The best bit. Bring back the charts! Groan over – keep up the good work!
Mark T Baxter, Stockport

What d'you mean, only cater for 16-bit machines? Half of the categories in the buyer's guide cater for all machines, and given that a significant portion of our readers have 16-bit machines, this seems a fair balance.

The 8-bit specific pages are in black and white because they've always been that way, and to be honest 16-bit graphics deserve the colour pages.

We'll certainly think about biographies for the 'alternative' micros.

SHOPPING EXPRESS
The weekly computer market place for people serious about buying
Monitors, scanners, joysticks and mice
The best hardware buys revealed!
JOB SHOPPING?
Check out our recruitment section inside
ALSO INSIDE
● Take advantage of our latest mail order offers.
● Benefit from our reliable buyers' guides. No waffle, just facts.
● Gain more than £10 off mail order prices by using Express vouchers.
● Score on the free reader adverts. Sell your products for absolutely no charge!
Save your cash, save your time
SAVE MONEY
Use these Express Vouchers with the ads inside
Full details overleaf
EXPRESS VOUCHER 50p
EXPRESS VOUCHER £1
EXPRESS VOUCHER £3
EXPRESS VOUCHER £6
• *Shopping Express: an integral part of* Express

THE QUIZ OF THE YEAR

Actually, that's also a strong contender for the most misleading headline of the year. To test your memories to the limit, we have culled all of these questions about the events, personalities and products of 1989 from the first six months of the year only.

WHO HE? – ED

The following were all in the news during the year. Some were barely famous for Andy Warhol's suggested 15 minutes, while others are still going strong. What, if anything, can you remember about:

1 **Kevin Mitnick**
2 **Brian Dixon**
3 **Colin Dooley**
4 **Jeffrey Armstrong**
5 **John Austin**

NAME OF THE GAME

The following extracts appeared in reviews of which leisure software releases:

6 **"As the parser understands Flirt, Give, Grip, Hold, Kiss, Lift, Play, Push, Smell, Swing, Taste and Touch, you can guess your main objective."**

7 **"Alien amusement parks found on Mars, two-headed squirrels, Bigfoots winning records for non-stop kissing, microbuses turning into space shuttles..."**

8 **"The rounds feature four-option multiple choice questions from the picture board, mystery personality, home and away, what happens next and quick-fire – so the game follows exactly the same format as the series."**

9 **"There are no annoying retypes involved in sentences such as 'Davout, form an attack line from 1/2 mile southeast of Shevardino linking with Ney to 1/2**

mile southeast of the Redan liinking with Poniatovski'."

10 **"Each mission involves completing the objective randomly assigned during the preflight briefing, and as there are in excess of 1,500 targets within each combat zone, there's more than enough to keep you occupied."**

QUOTE, UNQUOTE

Who, or a spokesperson for whom, uttered the following between January and May 1989:

11 **"When I was a youngster, the only violence I saw was at the cinema on Saturday mornings with the Lone Ranger or spacemen."**

12 **"The hard-core simulation people only account for about 25 per cent of gamers. We want to get the hard-core arcade people as well... we intend being a $100 million company."**

13 **"It's an extremely lucrative embarrassment, and an anachronism. Like your Aunt Ethel, it never seems to go away."**

14 **"It will mean a one thousand times increase in the speed of memory access compared to current hard disk standards. This has been seen as the holy grail of computing for the last 20 years."**

15 **"We are developing new hardware, but if we launch it later this year and it turns out to be a solar-powered flashlight, you're going to look pretty stupid."**

WHODUNNIT?

Who did the following things over the first six months of this year:

16 **Attempted to ban the word 'software'.**
17 **Reportedly pocketed £100,000 in cash and narcotic drugs.**
18 **Behaved bullishly in a China shop.**
19 **Saw over £50 million disappear from his assets – on paper at any rate – in one day.**
20 **Reached for a 'Port' in a storm.**

WHAT WAS IT?

Can you recall which product reviews carried the following excerpts:

21 **"From time to time they come up against perils generated at random such as polar bears and crevices"**

22 **"...a space not much bigger than the palm of your hand ... there is not a lot of room for your fingers ... battery life is quoted at six to eight weeks 'regular use'."**

23 **"There are also plans afoot to release gazetteer**

add-ons – English National Heritage sites, good pubs, National Trust areas and hotel chains are some of the guides being talked about."

24 **"Although the miniature super-twist screen supports a full 80-column display with characters barely discernable to the human eye [it will be bundled with] glasses able to magnify on-screen images to a size claimed to emulate a 14-inch monitor."**

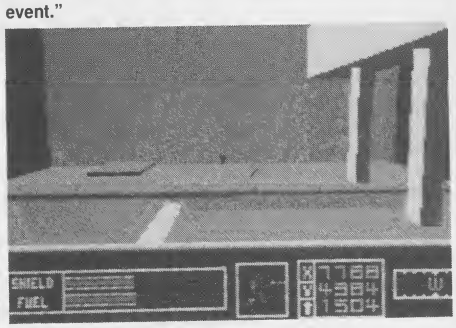
25 **"Control modes may be configured on the basic unit by disengaging a clutch mechanism and rearranging the main pillar or bolting on peripherals. Car, motorcycle and aeroplane modes are available..."**

DID I SAY THAT?

Five more of the year's quotes. How much 'who, where, why, when' information can you attach to the following:

26 **"It's disgraceful and sadly it's also a bad reflection on the software industry. These are simply racists with a knowledge of computers."**

27 **"It was no longer economically viable. It could have been done on a market stall basis, but we're not interested in associating ourselves with that sort of event."**



28 **"I want the Archimedes market."**

29 **"These are people with no brains and a sick sense of humour. I would guess that they're in the 14 to 15 age group... I'm just waiting for someone to start boasting."**

30 **"It was exciting, but in another sense it was dreadful because I got zero astronomy done for two years."**

PLAY IT AGAIN

Five games for you to identify from these review extracts:

31 **"You are able to move your cursor around a zoomed-in Campaign Map, where you can gain information and issue orders to your forces. You can also select which character should be the ring-bearer."**

32 **"You appoint a papal magnate to explore new territories and can instruct his followers to engage in fights with your opponents' acolytes when they meet."**

33 **"From time to time you back up performances with practice days and publicity, in order to make as much dough as possible... keeping an eye on wage bills and other overheads such as Porches."**

34 **"Holding down fire and moving the stick from left to right allows you to increase or decrease the power of the shot... you may also zoom in or out of a position – particularly useful if the balls are packed tight."**

35 **"You have a revolver, wrist watch, water bottle and compass to help you manouvre your way through the subterranean maze and negotiate levitating floors, shrinking rooms, invisible walls, disappearing stairways and mirages..."**

NUMBER CRUNCHING

Can you recall where the following numbers came into play during 1989:

36 **1813** (nothing to do with military strategy games).
37 **17,000** (businesses).
38 **154** (one of somebody's vital statistics).
39 **10,283** (years).
40 **1,034** (square miles).

Questions 41 to 44 are to name the software titles from which we have reproduced screen-shots on this page.

This quiz is all in fun, so please don't send your answers in begging for a prize. But do hang on to your copy for reference, because we will be printing the answers in the next issue.■

520ST-FM SUPER PACK

1Mb DISK DRIVE £450 OF SOFTWARE

ARCADE GAMES

Arkanoid II	Imagine	£19.95
Beyond The Ice Palace	Elite	£19.95
Black Lamp	Firebird	£19.95
Buggy Boy	Elite	£19.95
Chopper X	Mastertronic	£9.99
Ikari Warriors	Elite	£14.95
Marble Madness	Electronic Arts	£24.95
Quadralien	Logotron	£19.95
Ranarama	Hewson Consultants	£19.95
Return To Genesis	Firebird	£19.95
Roadwars	Melbourne House	£19.95
Starquake	Mandarin	£19.95
Test Drive	Electronic Arts	£24.95
Thrust	Firebird	£9.95
Thundercats	Elite	£19.95
Wizball	Ocean	£19.95
Xenon	Melbourne House	£19.95
Zynaps	Hewson Consultants	£19.99

SPORTS SIMULATIONS

Eddie Edwards Super Ski	Elite	£19.95
Seconds Out	Tynesoft	£19.95
Summer Olympiad '88	Tynesoft	£19.95

PRODUCTIVITY SOFTWARE

Organiser	Triangle Publishing	£49.95

JOYSTICK

Atari CX40 Joystick	Atari Corp	£4.99

FREE ATARI BUNDLE VALUE: £458.97

The Atari Super Pack is ideal for you if you want to get off to a flying start with the best in entertainment software. The Pack includes a 520ST-FM with ½Mb RAM, a built-in 1Mb disk drive, over £450 of top games and a joystick. If you buy the Super Pack at Silica Shop, we will add our own ST Starter Kit (worth over £200), Free Of Charge. Return the coupon for details.

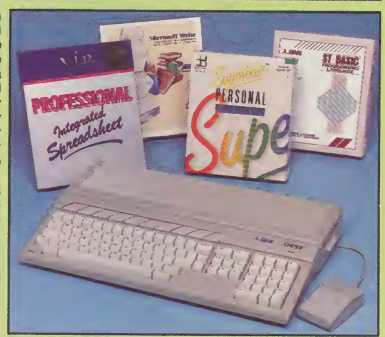
£399 INCLUDING VAT

With SM124 mono monitor: £498 INC VAT With SC1224 colour monitor: £698 INC VAT

1040ST-FM PROFESSIONAL PACK

NOW WITH TV MODULATOR

For the serious home user and the small business, we are pleased to announce a new package based around the 1040ST-FM. The 1040ST-FM has 1Mbyte RAM and a 1Mbyte built-in disk drive. In addition, the 1040ST-FM now comes with a TV modulator built-in. (The previously available 1040ST-F was designed for use with a monitor only and did not come with a modulator.) This modulator allows the 1040ST-F to be plugged directly into any domestic TV set, and comes complete with a lead to allow you to do so. The new 'Professional Pack' from Silica includes the new 1040ST-FM with modulator plus four high quality software packages including a spreadsheet, database, word processor and programming language. This 'Professional Pack' software will enable you to get straight down to business with your new computer. In addition to this software (worth £384.84), if you buy the Professional Pack from Silica Shop, you will also receive the Silica ST Starter Kit (worth over £200), Free Of Charge. Return the coupon for further information.



£499 INCLUDING VAT

With SM124 mono monitor: £598 INC VAT

With SC1224 colour monitor: £798 INC VAT

ATARI 1040ST-FM	(Computer)	£499.99
VIP PROFESSIONAL	(Spreadsheet)	£149.95
MICROSOFT WRITE	(Word Processor)	£149.95
SUPERBASE PERSONAL	(Database)	£59.95
BASIC DISK & MANUAL	(Language)	£24.98

NORMAL RRP: £884.82

LESS DISCOUNT: -£385.82

PROFESSIONAL PACK PRICE: £499.00

2Mb & 4Mb MEGA ST

The MEGA ST computers are styled as as lightweight keyboard with a separate CPU, connected by a coiled telephone style cable. There are two versions of the MEGA ST, one with 2Mbytes of RAM and the other with 4Mbytes. Each version has a 1Mbyte double sided disk drive built-in to the CPU unit. The MEGA ST's do not come with modulator built-in and must therefore be used with a monitor. With every MEGA ST purchased, we will add the 'Professional Pack' software (worth £384.83) detailed above, plus the Silica ST Starter Kit (worth over £200) both Free Of Charge. Return the coupon for further details.

2Mb MEGA ST
£899 INC VAT
+mono monitor=£998
+colour monitor=£1198

4Mb MEGA ST
£1199 INC VAT
+mono monitor=£1298
+colour monitor=£1498

DTP PageStream £149 +VAT =£171.35

Desktop Publishing (DTP) is one of the fastest growing applications for personal computers. We are pleased to announce a powerful low cost package for the Atari ST called PageStream. PageStream costs only £149 (+VAT=£171.35) and, because it works with an Atari 1040ST and a Seikosha SP-180AI printer, you can be up and running with a complete system for less than £1000. Some of the features of PageStream are listed to the right. If you would like further information on this program, complete and return the coupon below, ticking the 'DTP' box in the corner.

- TEXT-FLOW AROUND GRAPHICS
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ATARI ST

ST COMPUTERS

The range of Atari ST computers offers something for everyone. From the games enthusiast who wants the challenge of the very best in arcade action, to the businessman who wants to make financial forecasts or faultless presentations. The ST offers high quality graphics, sound and speed for the gamer, whilst providing a fast, user friendly and affordable solution to business. The ST is now firmly established in the home environment and boasts a wealth of users in education, local government, television, and a variety of different businesses. Software for the range stretches to cover applications as diverse as ENTERTAINMENT, ACCOUNTS, ART, COMMUNICATIONS, COMPUTER AIDED DESIGN, DATABASES, DESKTOP PUBLISHING, EDUCATION, MUSIC, PROGRAMMING, SPREADSHEETS, WORD PROCESSING and more. For a full list of the software available, as well as details of the ST range, complete and return the coupon below.

All prices correct at the time of going to press. E&OE

520ST-FM EXPLORER PACK

WITH BUILT-IN 1Mb DISK DRIVE

The value for money offered by the Atari ST range is reflected in the Explorer Pack featuring the 520ST-FM computer with 512K RAM. The 520ST-FM computer now comes with a built-in 1 Mb double sided disk drive as well as a free mouse controller and a built-in TV modulator. The new 520ST-FM Explorer Pack includes the 520ST-FM computer, the arcade game Ranarama, a tutorial program and some useful desktop accessories. In addition, if you buy the Explorer Pack from Silica, we will give you the Silica ST Starter Kit worth over £200, FREE OF CHARGE. Return the coupon for details of our Starter Kit and of the full ST range.

£260 ONLY £2.51 PER WEEK RETURN COUPON FOR DETAILS

+VAT= **£299**

+ SM124 mono monitor: £398 INC VAT + SC1224 colour monitor: £598 INC VAT

WHY SILICA SHOP?

Before you decide when to buy your new Atari ST computer, we suggest you consider very carefully WHERE you buy it. There are MANY companies who can offer you a computer, a few peripherals and the top ten selling titles. There are FEWER companies who can offer a wide range of products for your computer and expert advice and help when you need it. There is ONLY ONE company who can provide the largest range of Atari ST related products in the UK, a full time Atari ST specialist technical helpline and in-depth after sales support, including free newsletters and brochures delivered to your door for as long as you require after you purchase your computer. That one company is Silica Shop. We have been established in the home computer field for ten years with an annual turnover in excess of £8 million and can now claim to meet our customers requirements with an accuracy and understanding which is second to none. But don't just take our word for it. Complete and return the coupon below for our latest literature and begin to experience the Silica Shop specialist Atari service.

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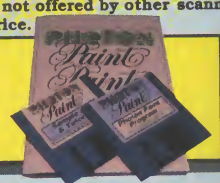

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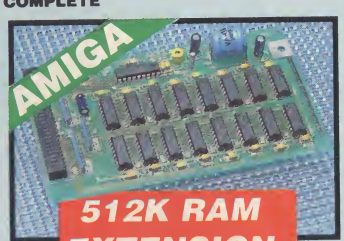

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